THREE ESSAYS IN CORPORATE FINANCE

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I hereby that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

Signature…….

Abstract

The financial crisis that started in 2008 led to issues of corporate financial distress and bankruptcy. The global financial crisis has resulted in many venerable institutions being rescued by the government. There is an ongoing research debate in law and economic theories about the efficiency of the US bankruptcy code (Senbet and Wang, 2012; Jory and Madura, 2010; Zhang, 2010; Faelten and Vitkova, 2014). Due to the global financial crisis, there is a fundamental issue questioning whether the bankruptcy law (e.g., Chapters 11 and 7 of the US Bankruptcy Code) is efficient in rehabilitating economically efficient but financially distressed firms and liquidating economically inefficient firms (Senbet and Wang, 2012). Mergers and acquisition (hereafter M&A) involving financially distressed targets and bankrupt targets have become a common practise in the US. Theoretically, restructuring is meant to be a way of reorganizing operations and generating extra resources. However, due to the complexity of businesses and recent global financial crises, there is inconsistency in the association of rewards for Chief Executive Officers (CEOs) and management with the firm's performance.

This thesis explores the issues about corporate restructuring, performance and governance of firms including banks in the US emanated from the economic crisis. It comprises three empirical pieces of research. The first empirical research is on the wealth creation of bidders and of M&As of financial distressed and bankrupt targets. Our second research is about the earnings management behaviour of managers. Of those that were involved in the restructuring and reorganization of an organization. It is especially related to carve-out, sell-off, spin-off and other types of divestitures. Our third essay is on bank efficiency; taking into consideration the importance and crucial and urgency in the research related areas, such as the pay structure of the top management, and the existence of the internal monitoring. Institutional ownership plays an important role in corporate performance of firms particularly to banks in the US.

First, we examine the wealth effects of M&A activities involving financially constrained targets (hereafter FCTs). By interrogating the wealth creation of bidders of these target firms, this study extends the analysis on the relationship between the

discount on deal value, and the financial health of bidder firms. Based on sample data between 1985 and 2012, the study finds that bidders of FCTs earn abnormally positive cumulative abnormal returns (CARs) the day of the M&A announcement. This contrasts with the findings of negative to zero CARs accruing to bidders of financially healthy targets, as documented in the literature. The bidder firms benefit from a low M&A premium on these deals. However, in the long run, both their stock and operating performance lag those of bidders of healthy targets.

Second, we examine the earnings management (hereafter EM) behaviour of firms engaged in corporate reorganization and restructuring. More specifically, our sample includes carve-outs, spin-offs, asset sell-offs, and divestitures. We follow Anagnostopoulou and Tsekrekos (2015) and Cohen and Zarowin (2010) to calculate the EM variables. This is so especially the accrual-based and real EM variables. To measure firm performance, we use industry-adjusted return on assets (ROA), cumulative abnormal returns (CARs), and Buy-and-Hold Abnormal Return (BHARs). We use the standard deviation of monthly stock returns (SDAR), as the proxy to measure the stock volatility and information asymmetry. We document a direct relationship between firms that manage earnings above the industry-year median EM index, and changes in the ROA, CARs, and BHARs. Conversely, firms that manage their earnings EM are associated with lower standard deviations in the firms' stock returns for carve-outs.

Finally, we examine the relationship between the CEO's pay (CPS) and each of the bank's efficiency and risk. We use several measures of CEO pay including the ratio of CEO pay-to-the total pay of the top five managers. The ratio of CEO pay to the total pay of executives who also serve on the firm's board. We use the Stochastic Frontier Analysis (SFA) to measure bank efficiency. To measure firm risk, we compute the Z-Score and standard deviation of daily and annual returns. We document an inverse relationship between CEO pay ratio and bank efficiency. Conversely, high pay disparity is associated with lower insolvency risk, lower Z-scores, and lower standard deviations in the banks' stock returns.

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Table of Contents

List of Figures

List of Tables

List of Appendices

List of Abbreviations

2SLS: Two-stage Least Squares

AEM: Above Industry-Year Median Earnings Management

AM: Accrual-based Earnings Management

AMEX: American Stock Exchange

CAR: Cumulative Abnormal Return

CEO: Chief Executive Officer

CFO: Chief Financial Officer

CPS: CEO pay slice

CRSP: The Centre for Research in Security Prices

BEM: Below Industry-Year Median Earnings Management

BHR: Buy-and-Hold Return

BHAR: Buy-and-Hold Abnormal Return

EBITDA: Earnings Before Interest, Taxes, Depreciation, and Amortization

EBIT: Earnings Before Interest and Taxes

DEA: Data Envelopment Analysis

e.g.: for example

EM: Earnings Management

FC: Financial Constraint

FCT: Financially Constrained Target

FSOC: Financial Stability Oversight Council

HSM: Heckman Selection Model

HT: Healthy Target

i.e.: that is

IMR: Inverse Mills Ratio

IPO: Initial Public Offering

IV: Instrumental Variable

KZ: Kaplan and Zingales (1997) model

NYSE: New York Stock Exchange

M&A: Mergers and Acquisitions

OCF: Operating Cash Flows

OECD: The Organisation for Economic Co-operation and Development

OLS: Ordinary Least Squares

PPE: Property, Plant and Equipment

R&D: Research and Development

ROA: Return on Assets

RM: Real Earnings Manipulation

SDAR: Standard Deviation of Annual Return

SDC: Securities Data Corporation

SDD: Standard Deviation of Daily Return

SEC: Securities and Exchange Commission

SEO: Seasonal Equity Offering

SFA: Stochastic Frontier Analysis

SIC: Standard Industrial Classification

SOX: The Sarbanes-Oxley Act of 2002

TARP: Troubled Asset Relief Program

TMT: Top Management Team

UK: United Kingdom

US: United States (of America)

VP: Vice President

WRDS: Wharton Research Data Services

Chapter 1

Introduction

1.1 Motivation and Theoretical Background

The global financial crisis that started in late 2008 led to issues of corporate financial distress and bankruptcy, which resulted in many vulnerable institutions being rescued by the government. Due to the global financial crisis, there is an ongoing debate whether the bankruptcy law (e.g., Chapters 7 and 11 of the US Bankruptcy Code) is efficient in rehabilitating economically efficient but financially distressed firms and liquidating economically inefficient firms (Senbet and Wang, 2012; Jory and Madura, 2010; Zhang, 2010; Faelten and Vitkova, 2014). Restructuring is meant to be a way of reorganizing operations and generating extra resources to resolve financial distress. For example, mergers and acquisition (M&A) involving financially distressed/constrained targets and bankrupt targets have become a common practice in the US. However, due to the complexity of businesses and recent global financial crises, there is inconsistency in the association of rewards for Chief Executive Officers (CEOs) and management with the firm's performance. CEO compensation package most of the banks before the financial crisis in the US is consider as excessive (Ritholtz, 2011). Many of CEO or executives of big banks received large compensations, then bailed after they destroyed their banks (e.g., Lehman Brothers, Merrill Lynch, Countrywide Financial[1]). Lehman Brothers Chairman and CEO Richard Fuld Jr. sold his $490 million Lehman Brothers stock in the years before Lehman filed for Chapter 11 Bankruptcy (Ritholtz, 2011).

This thesis explores the issues about corporate restructuring, performance and governance of firms including banks in the US emanated from the economic crisis. It

[1] Countrywide Financial is now owned by Bank of America.

comprises three empirical pieces of research. We analyse the issues that emanated from the global financial crisis dates in 2008 that was characterized by the collapse of major financial institutions and stock markets. Businesses took on more risks than originally thought (Liu *et al.,* 2014; Cheng *et al.*, 2015; Yu and Van Luu, 2016), bank Chief Executive Officers (CEOs) were grossly overpaid (Vallascas & Hagendorff, 2013; Yu & Van Luu, 2016) and firms engaged in earnings management practices (Mollik, Mir, Mclver, & Bepari, 2013). The global financial crisis of 2008 was the most severe world financial crisis since the Great Depression of the 1930s (Yen, 2017). It raised concerns about the solvency and liquidity of venerable institutions, and huge financial commitment by governments in the form of bailouts; these affected economic activity as a whole (Ivashina and Scharfstein, 2010).

CEOs enjoy high pay even though they engage in non-value-maximizing behaviour. For example, Lehman Brothers Chairman and CEO, Richard Fuld Jr., made US$34 million in 2007 and nearly a half-billion, US$490 million, from selling Lehman stock in the years before Lehman filed for Chapter 11 bankruptcy (Ritholtz, 2009, 2010). Overconfident CEOs receiving high excess pay undertake activities such as overinvestment, restructuring and value-destroying mergers and acquisitions that lead to shareholder wealth losses (Cooper *et al.*, 2016). CEO pay structure should be re-evaluated to safeguard shareholders' assets and long-term profitability of the firm. CEO pay structure is also partly to be blamed.

> "Lehman's failure resulted in part from significant problems in its corporate governance, including risk management, exacerbated by compensation to its executives and traders that was based predominantly on short-term profits." (FCIC (Financial Crisis Inquiry Commission), 2011, p.343).

The high pay ratio between CEOs and the other top management executives led to excessive risk-taking behaviour. This led to business expansion that was not necessarily considered value maximizing activities. Agency problems may lead to non-value maximizing behaviour or hubris among management (Jensen and Meckling, 1976). This includes the M&As of bankrupt or financially distressed targets.

In the first quarter of 2016, total corporate bankruptcies slightly increased : March 2016 was the busiest filing month since April 2014 (Golubow, 2016). In fact, 2014 was

the year where M&As in the US were the most active; the deal value of M&As in the US in the first three-quarters of 2014 reached almost US$1 trillion (KPMG, 2015). A recent Mergermarket and RR Donnelley survey reports a record-breaking year for deals in 2015. The value of corporate spinoffs, carve-outs, and divestitures rose to US$523.6bn, representing a 30% year-over-year increase; this trend will continue into 2016.

It is likely that managers of the bidding firms view takeovers as a means of maximizing their own interests at the expense of their shareholders (Cartwright and Schoenberg, 2006). Firm restructuring is one form of redistributing firms' resources to maximize the shareholders' wealth. However, due to agency problem and management hubris, behaviour leads to the possibility of engaging in earnings management (hereafter EM) activities to cover a firm's financial underperformance. Furthermore, it is worth examining how the market reacts to current issues surrounding the restructuring practices. It could be just a 'game' that top management play for the sake of rent-seeking behaviour and to make their profiles active. This could explain the complexity of the issues raised after the global financial crisis. Markets should have perceived the economic consequences resulting from the global financial crisis.

In analysing corporate performance and governance, we analyse the performance of firms, including banks in the US. We also consider the current issue of mergers and acquisitions (M&A) involving bankrupt or financially constrained targets (hereafter FCT), restructuring activities through carve-outs, sell-offs, spin-offs, and divestitures in the US. We also include the controversial issue of CEO pay disparity in the banking industry, and the need to explore the gap in the related literature.

Adhering to the above explanation, our first two empirical chapters of the thesis intend to examine the corporate performance of the bidders and targets post-restructuring. What are the determinants that contribute to the choice of FCTs or bankrupt targets over healthy targets? What will be the impact of the choices in bidders' corporate performance? Do the earning management (EM) activities among targets, before the restructuring through cave-out, sell-off, spin-off and divestiture, have an impact on the corporate performance of the targets?

Understanding how a corporation sets executive pay, and the role of shareholders in the process of setting it, takes us into the issues of corporate controls, corporate goals,

and corporate reorganisation and restructuring. We analyse factors that contribute to corporate performance through restructuring and CEO remuneration. The falls of Lehman Brothers where the CEO received high pay a year before the crisis is questionable. The rewards should compensate the efforts of maintaining the performance and safeguarding the shareholders' assets. Hence, our third study is on CEO pay disparity and the association with bank efficiency, and risk-taking behaviour among bank managers. Furthermore, starting from 2018, firms must publish, in their annual financial statements, their pay ratio between the CEO and the other top four management teams.

The requirement to publish CEOs' pay is not without controversy. The Securities and Exchange Commission (SEC) took five years to settle on an agreed set of pay ratios, which was made public in 2015. Companies, however, are not required to publish these ratios until 2018. The "say on pay" and related governance rules are now incorporated into the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act). The Act mandates companies to publish CEO's annual pay, top executives' pay, and the median pay of all their employees; this is to inform investors of their pay structures. More research is needed to establish the link between executive pay and bank performance since it continues to preoccupy public interest (also see Yu and Van Luu, 2016). There may be more aspects to explore when it comes to theories that seek to explain the usefulness of pay disparity and its impact on firm performance. The existence of institutional ownership could stabilize and control management hubris among the top management.

The next three sections of this chapter provide a short explanation of the research objectives, methodology, findings, and contributions of the three essays in this thesis.

1.2 Does the bidder of financially distressed firms in M&A in the US earn positive firm performance?

We use the Kaplan and Zingales (1997) index (henceforth KZ-Index), to measure the financial condition of M&A targets, and provide new dimensions related to the financial constrained targets (FCTs) versus healthy targets (HTs) in at least four ways. Ultimately, we attempt to:

(i) identify the financial characteristics that influence US bidders' decisions to acquire one target rather than another;

(ii) determine how M&A involving FCTs influence bidders' wealth, both in the short and long run; and

(iii) examine the discount or premium paid by the bidder firms in the M&A of FCTs.

To conduct our empirical approach, we construct a sample of 4,405 US M&As from the Thomson One Deal database over the period 1985-2012. We require that bidders should have data in the CRSP database to calculate the announcement period returns, buy-and-hold returns, and the discount/premium data. We retrieve the stock returns data from the Eventus database.

Methodologically, we provide an analysis of the wealth effect of bidders that acquire FCTs, as well as the bankrupt targets, by taking the universe of public US M&A from the Thomson One Deal database. After adjusting for self-selection bias, which may result in the choice between higher FCTs or bankrupt targets, we document that there is a certain consistency in our results. We find that the Cumulative Abnormal Returns (CARs) for the three-day event window of (-2, 0) for acquirers that acquire financially constrained or bankrupt targets, is greater compared to those acquirers that acquire healthy targets. However, there is no significant finding when it comes to the long-term wealth creation of acquirers. We also find that in terms of the M&A deals, bidders of FCTs pay discounts to FCTs rather than a premium.

This research contributes to the literature in several ways. First, we use the universe of US M&A from the Thomson One Deal database for the years 1985 to 2012. Our sample size comprises of 4,405 completed M&As in the period of analysis. Second, we examine the wealth effects between FCTs that are not bankrupt and bankrupt targets. The analysis of both types of financial condition of targets, provide the understanding of the similarities of the wealth effect between the two types of M&A. Third, our findings are contrary to the previous findings by (Khatami, Marchica, & Mura, 2015). They claim that financial constraint targets (FCT) significantly increase acquisition premiums for targets. We find that FCT are acquired at discounts. The discount in the deal value compared to

acquisitions of healthy targets represent the fee bidders charge to lessen the target's financial constraint condition. We suggest that M&A of FCT or bankruptcy targets represent a feasible corporate restructuring and reorganisation strategy to lessen the financial constraints of targets and to extract value for the bidder shareholders. Fourth, we examine the factors that contribute to the choice of the bidders to acquire financial constraint targets (FCT) and bankruptcy targets, by applying the Heckman Selection Model (HSM). Lastly to our knowledge, this paper is the first paper that analyses the comparisons between the two types of financial conditions of targets in one study, i.e., financial constraints (using KZ-Index) and bankrupt targets.

We submitted some parts of the first essay to the Journal of Applied Economics. The paper from the first essay, "Acquisitions of Financially Constrained Targets," is a joint paper with Dr Surendranath Jory and Dr Nnamdi O. Madichie. We enclosed the paper in the appendix section for reference only and to show the outputs from Essay 1. The paper sent to the Applied Economics Journal focuses only on M&As involving financially constrained targets, and not M&As of bankruptcy targets as in Essay 1 of the dissertation. Our first essay presented in the thesis is more detailed and comprehensive and include as targets both financially-constrained and bankrupt ones. The thesis version of the first essay is solely the work of the candidate. The co-authors 'contribution is merely refining the whole paper and make it more precise and clear. Co-authors involved in mapping out the whole structure of the paper.

1.3 Are there any earnings management activities among the targets that are involved in restructuring?

Due to the importance of future company restructuring, and the wealth creation of the targets, in our second empirical chapter we are motivated to fill the gaps in the literature. We explore the earning management (EM) of firms involved in restructuring, especially through carve-outs, sell-offs, spin-offs, and other divestitures. We argue that information asymmetries between bidders and targets may lead managers to opportunistically manipulate their earnings. This may be because real earnings management activities are hard to detect (by auditors) as managers will be able to give reasonable and rational reasons for certain actions or transactions on their part.

In order to investigate the EM activities among the target firms that are involved in restructuring through carve-outs, sell-offs, spin-offs, and other divestitures, which impact the future wealth of the targets, we aim to address four main research questions:

(1) Whether the firms are engaged in earnings management activities in the years prior to corporate restructuring;
(2) Whether the EM activities by firms engaging in corporate restructuring affect the wealth creation of target parent firms
(3) Whether the firms who manage their earnings above the median industry year EM index have less stock volatility; and
(4) What are the factors that could explain the choice of accrued versus real earnings by the management.

Among the firms that are involved in the restructuring, we analyse both the accrual-based and real earnings management activities to have a complete view of the EM activities by targets firms, especially carve-outs, sell-offs, spin-offs, and other divestitures. To avoid any selection bias, we use the Heckman Selection Model (1979) (hereafter HSM).

We document a direct relationship between firms that manage earnings above the industry-year median EM index (hereafter AEM), and changes in return on assets (ROA), cumulative abnormal returns (CARs), and buy-and-hold abnormal returns (BHARs). Conversely, firms who manage their earnings EM are associated with lower standard deviations in the firms' stock returns for carve-outs. We provide evidence that, on average, target companies manage earnings downward through accrual-based and real EM the year before the announcements, and continue after the announcements. This finding is consistent with our hypothesis of our third essay on EM. Our hypothesis H1 states that firms that engage in corporate reorganisation and restructuring i.e., carve-out, sell-off, spin-off and other divestitures exhibit evidence of accrual based earnings management (AM) and real earnings manipulation (RM). Our finding suggests that

parent targets[2] that are involve in restructuring tend to engage in income-decreasing EM activities to increase chances of being acquired. The differences in the changes in ROA, CARs, BHARs, and standard deviation of monthly stock returns (SDARs) between (1) parent targets that manage earnings below the industry year median EM index (hereafter BEM) and, (2) parent targets that manage earnings above the industry year median EM index (AEM) are associated with EM activities. The differences in ROA between the two groups can be explained by the negative coefficient of the EM proxy. We find that there is a negative relationship between the changes in ROA and the EM for the carve-out sample. We do not find any significant coefficient of EM proxy for other samples.

We have made a contribution to the literature by documenting that firms use accrual-based EM and real EM activities around a specific corporate finance event restructuring. This research contributes to the literature in several ways. First, we extend the work of Balatbat and Lim (2003) and produce evidence on the relative effects of EM around corporate restructuring regarding a firm's future performance. We provide new empirical evidence on the impact of the EM activities on the targets' future accounting performances, as well as the stock returns in both the short and long-term. Second, we add to the literature by showing that targets that engage in restructuring through carve-outs, sell-offs, spin-offs, and divestitures also engage in accrual-based and real earnings manipulation EM in the years surrounding the announcements. Third, we analyse the factors that affect EM activities by firms that are involved in restructuring. By examining both types of AM and RM activities, we provide the evidence of trade-off between the two types of EM. Lastly, we show the significance of specific items in financial statements, i.e., items correlated with accruals-based earnings management (AM) and real activities manipulations (RM) activities, instead of relying on overall earnings. For

[2] A parent target is a parent company of a target company that being involved in the restructuring events used in this study. Parent target owns or controls other firms (i.e., subsidiaries). The restructuring events in this study are carve-out, spin-off, sell-off and other divestitures.

example, the level of net operating assets (NOA) reflects previous EM to some extent (Barton and Simko, 2002).

As has been discussed at the beginning of this chapter, the understanding of how organisations set their CEO compensation structure and the rest of the top management team sets the qualities of the corporate controls, corporate goals, and corporate restructuring. Due to the importance of the pay ratio of the CEO and the rest of the management team, our research focuses to the banking industry, and to analyse the impact of the CEO pay disparity between CEOs and the rest of the management team. We analyse the efficiency and risk-taking behaviour among bank managers. In the next section, we will explain the research in more detail.

1.4 Is the efficiency of banks in the US associated with the CEO pay slice (CPS)?

Our third empirical research is on the effect of CEO pay disparity (CPS), governance and bank efficiency, and risk-taking behaviour among the management. CEO compensation represents a fundamental internal governance mechanism to mitigate the inherent agency conflict present in public firms (Pissaris *et al.*, 2010). There are various aspects to explore in the relationship between pay disparity and bank efficiency. Our work provides an analysis between pay disparity and firm efficiency, returns volatility and insolvency risk.

In this study, we devise alternative measures of disparity in pay between CEOs and other bank staff, and study the link between those measures and the bank's performance with regard to efficiency, risk-taking activities, and bank stability. To measure pay disparity, we compare the pay of the bank's CEO with various groups comprising their management staff. More specifically, we compare the CEO's pay (CPS) to (i) the pay of the total remuneration of the bank's top five executives, including the CEO; and (ii) the top management team's pay. The top management team refers to all members of the board of directors of a firm.

We also address endogeneity issues of pay disparity by examining the causal link between firm performance and CEO compensation. We use a two-stage least square regression and simultaneous equation methods to mitigate issues with omitted

variables and reverse causality. We also want to show the consistency, and the need to replace the variables with instrumental variables in our analysis and to correct the endogeneity issues.

We find that a higher pay disparity is associated with lower bank efficiency. Conversely, CEO pay disparity is inversely associated with the standard deviation in the bank's stock returns and its bankruptcy risk. Thus, stable banks are associated with high CEO pay. We also find that institutional shareholdings and stability positively contribute to bank efficiency. Cumulatively, our results are consistent with our hypothesis that higher pay ratios are associated with rent-seeking and agency theory, and indicate that pay ratios are a useful tool to analyse bank efficiency and risk.

This study contributes to the literature in banking and finance in several ways. Despite the public and media outcry regarding the pay cheques of the CEOs at the largest US financial institutions, there are very few papers that examine the link between CEO pay and bank efficiency. To the best of our knowledge, the only paper that directly addresses the topic is Matousek and Tzeremes (2015). However, our study uses a different methodology, i.e. SFA: their study used the DEA. Our sample size is bigger, i.e., 121 US banks covering the period up to 2014, but their study is limited to only 37 banks for the period 2003 to 2012. We also examine the CEO pay disparity (CPS) in four different types of compensation, taking into consideration the current and contingent portion elements. However, Matousek and Tzeremes (2016) study the CEO salary and bonus payments, but not the pay disparity between the CEO and the top management. Additionally, we consider both the stock market risk and insolvency risk of the sampled banks. Our study offers various elements of CEO pay disparity (CPS) and bank efficiency, as well as corporate governance. Thus, our paper offers a rich set of interactions between the various elements of CEO pay and bank efficiency.

In terms of theoretical contribution, our study finds that there is not enough about the tournament theory that could explain the situation when it comes to CPS. Tournament theory suggests that executives will compete among themselves to move up the ladder until they reach the top job. This theory stipulates that large pay gaps provide incentives to executives to compete, leading to greater effort and improvement

in firms' performance. However, our findings suggest that CPS is merely directed to achieving short- as opposed to long-term targets, causing banks to take more risks.

Rent-Seeking theory is more appropriate in explaining the association between CPS and bank efficiency. This theory explains that rent-seeking behaviour is the attempt of individuals or groups to increase their welfare while making a negative contribution to net society welfare: focussing on short-term goals leading executives to take excessive risks. This basically contradicts the tournament theory that is normally used to explain the reason why certain CEO pay disparity is abnormally high in certain industries. When it comes to the association between CPS and efficiency, the rent-seeking theory is more suitable to justify the relationship. Our findings suggest that the higher the CPS, the lower the firm's efficiency due to excessive risk-taking behaviour among the executives.

Chapter 2

Mergers and Acquisitions of Targets in Corporate Financial Distress and Bankruptcy

2.1 Introduction

During 2014, mergers and acquisitions (M&A) activity in the US reflected the most active 12 months of deals since the 2007-2009 global financial crisis (Thomson Reuters, 2014), and the deal value in the first three-quarters of 2014 reached almost US$1 trillion (KPMG, 2015). M&A are one of the ways in which firms can opt to reorganize their operations and restructure payments to their creditors, rather than file for liquidation, especially if they are in a state of financial distress. When acquirers decide to acquire targets, they must analyse their target characteristics as well as the financial condition of the target firms. A review of M&A suggests some commonality between M&A involving financially constrained targets (FCTs) and M&A involving healthy targets (HTs). However, the existing research on M&A do not directly address what determinants one type of target to be preferred over the other. Target firms' financial conditions can range from healthy to distressed. To the best of my knowledge, there is limited research on the effects of target firms' financial health on bidders' wealth in M&As. This essay attempts to fill this gap in the literature. Consequently, this study attempts to (i) identify the financial characteristics that influence a bidder's decisions to acquire one target over the other; (ii) determine how M&A involving FCTs influence bidders' wealth, both in the short and the long run; and (iii) examine the discount or premium paid by the bidder firms in M&A of FCTs (we use the terms financially constrained and financially distressed inter-changeably).

We extend the Kaplan and Zingales (1997) index (henceforth KZ-Index), which measures the financial condition of M&A targets, and provide new insights in acquisitions of financially constrained targets (FCTs) and healthy targets (HTs). Lamont, Polk, & Saá-Requejo (2001), whose study draws heavily from Kaplan and Zingales (1997),

define “financial constraints” as frictions that avert a firm from financing all its anticipated investments. The interesting question, therefore, is whether investors perceive the M&A market as a place to resolve target firms’ financial constraints. Erel, Jang and Weisbach (2015) examine a sample of European acquisitions and follow target firms post- acquisition and provide evidence that following the acquisition, target firms lower their cash holdings, experience lower sensitivity of cash-to-cash flow and report lower sensitivity of investment-to-cash. The authors suggest that acquisitions relieve financial frictions at target firms and is a potential source of value. However, 97.4% of their sample targets are private firms. It would be of interest to see whether investors reward the acquisitions of publicly-listed traded targets, which are subject to more public scrutiny and have access to more sources of funds (for instance, the stock market) than private firms. Our paper is a test for evidence using a different sample (i.e., US-based domestic acquisitions), wealth variables (i.e., stock market-based M&A announcement period returns and M&A premiums) and measures of targets’ financial constraints (i.e., the Kaplan-Zingales Index) to determine the value created in acquisitions of financially-constrained targets. We believe that the sample of public targets provides a stiffer test of the benefits of M&A since these firms have access to more sources of funds than private firms do and, therefore, they would rely on the M&A market less than private firms do as a mean to resolve their financial constraints.

The wide usage of the KZ-Index as a measure of financial condition in the past literature indicates that it is widely accepted as an accurate, simple, and consistent measure of a financially constrained firm(Kaplan and Zingales, 1997; Lamont *et al.*, 2001; Livdan *et al.*, 2009; Khatami *et al.*, 2015; Meier and Servaes, 2015). The KZ-Index is, therefore, adopted in this study because it provides a comprehensive measure that allows for classifying targets into discrete categories of financial constraints. It also enables the use of the probit regression to relate to such classifications, with the data emerging from the current study. The dependent variable in the probit regression takes

a value of 1 for targets that are in the fourth quartile [3] (i.e., the most financially constrained) and a value of 0 for targets in the first quartile (i.e., the unconstrained firms). The usage of this index is consistent with (Kaplan & Zingales, 1997; Lamont et al., 2001; Livdan et al., 2009) as they classify firms on a scale from one to four on financial constraints. The element of the index consists of proxies for financial constraints. These include cash flow-to-assets, debt-to-assets, dividend-to-assets, liquid assets or cash-to-assets, and Tobin's Q. (Kaplan & Zingales, 1997) classify firms on a scale one to four and perform an ordered logit regression but we consider the two extreme groups to compare between the highly financial constraints and healthy firms. Furthermore, the KZ-index is a measurement of reliance on external financing. Firms with higher KZ-Index scores are more likely to experience difficulties when they are in financial constraints conditions and may have difficulties financing their ongoing business.

In this study, we extend the previous literature in a number of ways. First, we test the role of financial constraints on M&A activity on a recent sample of data using a comprehensive financial constraints index, i.e., the Kaplan Zingales Index (1997). To perform our test, we use a large sample of M&A announcements (i.e., 4,405) made in the US between 1985 and 2012, where both bidders and targets are publicly listed companies. We also perform another test for another sample of M&A announcements (i.e., 407) but involving bankrupt targets.

Second, we provide direct evidence that the level of financial constraints of target firms is an important source of value creation in M&A. We find that bidders of financially constrained targets pay higher acquisition discounts and earn higher announcement period cumulative abnormal returns than bidders of unconstrained targets. The higher discounts and positive stock market reaction are both creates wealth for bidder firms and sources of value for bidders' shareholders. Our results contrast the findings of the literature that document an insignificant wealth transfer to bidder shareholders.

[3] We also extend our analysis by adding the third quartile into the most financially constrained group.

Third, we show that financial constraints are a key determinant of the probability to be acquired by bidders. To this end, we employ a Heckman Selection Model (HSM). The HSM regression shows that bidders that acquire bankrupt/FCT have a positive market reaction surrounding the announcement day. This suggests that future studies that model M&A decision should account for the level of financial constraints in the targets firms to achieve a better estimation of bidders' wealth creation. Our results complement the literature as we show that target financial constraints play a major role in value creation.

In this study, the objective is to examine not only the drivers that motivate acquirers to acquire FCTs over healthy targets, but also to extend the study to examine the wealth creation of acquirers and the discounts/premiums in their deal value. We organize the paper as follows: we review the literature and articulate our hypotheses in Section 2.2.

2.2 Literature Review and Hypotheses Development

2.2.1 The characteristics of targets or bidders that engage in M&A involving FCTs

Certain bidders, targets and deal characteristics have been identified to correlate with the success of M&As and bidders' wealth. Among the characteristics are: the size of bidders (Humphery-Jenner and Powell, 2011); having M&A advisors (Agrawal *et al.*, 2016) high market-to-book acquirers; frequent acquirers; low risk acquirers; higher takeover premiums (Bruyland and De Maeseneire, 2014); acquisition of certain assets; targets operating in the same industry as acquirers (Laamanen *et al.*, 2014; Hotchkiss and Mooradian, 1998; Jory and Madura, 2009; Bruton *et al.*, 1994); and target financial liquidity (Jaffe *et al.*, 2015).

Most of the prior literature examines the factors that contribute to the wealth creation of acquirers, rather than the selection of targets, which is the focus of this essay. Humphery-Jenner and Powell (2011) indicate that post-takeover operating performance increases with acquirer size. It can be related to one of the factors that drive acquirers to acquire FCTs. Acquirers may perceive that besides taking advantage of all the benefits of acquiring financially constrained targets, operating performances could be related to the size of the acquirer.

Agrawal *et al.* (2016) examine the determinants of private sellers' choice of hiring M&A advisers and the effects of these choices on deal valuations. They point out that bidders' announcement returns are significantly lower in deals where the targets have M&A advisers, as this could have improved the targets' bargaining power and deal valuations. This relationship serves as a good basis for us to examine the existence of an acquirer's advisor as one of the drivers or determinants of the likelihood of an acquirer to acquire FCTs.

Jaffe *et al.* (2015) find that there is no relationship between the liquidity of the targets and the acquirer's CARs. This is an interesting finding and we intend to compare and contrast the wealth creation of bidders of M&A involving bankrupt targets, versus FCTs. The liquidity of targets could be one of the determinants of an acquirer to prefer FCTs over their healthy counterparts. (Oh, 2014) claims that target firm- level distress negatively affects a target's bargaining power, thus inducing a fire-sale discount that results in larger gains to bidders.

In addition, a financial constraints prediction model is very useful. In fact, for decision-making processes, it is a better tool compared to the traditional ratios for obtaining the first insight on the financial condition of a firm. However, it is important to analyse the factors or drivers as to why bidders acquire FCTs over healthy targets.

2.2.1.2 Wealth effects of acquirers that acquired FCTs

M&As remain an important corporate restructuring and reorganization strategy, and research on the topic has been on-going for several decades. The findings from the finance literature suggest that while M&As reward target firm shareholders, they fail to deliver for bidder firms' shareholders (Gregory, 1997; Agrawal and Jaffe, 1999). There are various propositions that have been advanced to explain this underperformance. For example, it is likely that managers of the bidding firms view takeovers as a means to maximize their own interests at the expense of their shareholders (Cartwright and Schoenberg, 2006). This is consistent with the classic agency theory of Jensen and Meckling (1976). There is also the possibility that these managers may overestimate the value of their target firms (Seth *et al.*, 2000), which is consistent with the managerial hubris hypothesis of Jensen and Ruback (1983) and Fuller *et al.* (2002).

Besides the finance literature, attempts to explain the disappointing performance of M&A have been made in the strategy and organizational behaviour literature. While not an exhaustive list, the following reasons have been advanced as explanations of the bidding firms' underperformance: wrong decision-making and poor integration processes (Schweiger and Very, 2003); poor organizational learning from prior M&A experiments (Hayward, 2002); and a lack of culture fit between the bidder and the target (Cartwright, 2005).

Despite the voluminous research on M&A, the empirical findings to date suggest that M&A continue to underperform. This situation has prompted calls for the examination of omitted variables in the extant literature (King *et al.*, 2000). We offer to examine the financial conditions of the target firms. A priori, it is difficult to imagine the exact effect of this variable on bidders' wealth. There are arguments for both sides, i.e., the successes and failures. Among the reasons that could help bidder firms is the possibility of benefitting from the deal discounts on financially constrained targets (FCTs).

Gilson *et al.* (2016) seek to provide a new perspective on the increased use of M&A for resolving or bailing out distressed firms. They highlight that M&A in bankruptcy cases often achieve similar economic outcomes as traditional re-organization exercises. This blurs the line between traditional reorganization vis-à-vis liquidation. There is also a noticeable shift towards the use of M&A in bankruptcy as a means of resolving challenges faced by financially constrained targets (FCTs) (see Khatami *et al.*, 2015; Lamont *et al.*, 2001; Livdan *et al.*, 2009). M&As are now an established alternative to pushing FCTs through the bankruptcy courts for a "Chapter 7 liquidation" or "Chapter 11 reorganisation". Chapter 7 and 11 of the U.S. Bankruptcy Code are both main choices in corporate bankruptcy. Chapter 11 of the Bankruptcy Code is regarding reorganisation and Chapter 7 is regarding liquidation. Most scholars favour Chapter 7 liquidation as it generally allocate resources to those who value them most (Lopucki & Doherty, 2004; Senbet & Wang, 2012; Shleifer & Vishny, 2011). Chapter 7 liquidation is a straightforward procedure. The court will appoint a trustee. The trustee liquidates the firm's assets and any proceed are then distributes to the firms' claimants. The court establishes the hierarchy of claimants. However, Chapter 11 reorganisation are more

complicated and allows the incumbent management to prepare a reorganisation plan that proposes an allocation of firm value among the existing claimants (Senbet & Wang, 2012).

However, there is also the real possibility that the target fails to add to the bidders' wealth because its poor financial state could not be resolved, which acts as a drag on the bidder's performance. The discounted value of the target firm may even reflect the lack of potential of the firm's assets. The true effect of the financial condition of the target firm on bidders' wealth can only be established via an empirical study, which we offer to do in this essay.

Studies that examine how financially distressed targets affect the wealth of bidders include Johnson and Abbott (1991) and Senbet and Wang (2012). They define the financial condition of firms from varied perspectives. In most of these studies the tools employed in categorizing firms as being in financial distress are different from the studies that examine financially constrained firms. Some of the most widely used tools for measuring financial constraints include the KZ-Index (Kaplan and Zingales, 1997; Lamont *et al.*, 2001), the Composite I and II, the pay-out ratio, and Hadlock and Pierce Index, which has also been employed by Khatami *et al.* (2015).

Although Johnson and Abbott (1991) do not show direct comparisons between M&A that engage with FCTs and non-FCTs, they provide grounds for a comparison undertaken in this study – albeit adopting a different methodological approach, i.e., Altman's Z-score (1968) to measure the financially constrained US firms for the period of 1973 to 1985. They also examine the wealth effects of FCTs and acquirers, along with the other factors that contribute to the wealth effects from the M&A activity involving FCTs. The key finding in their study is that bidders who acquired FCTs earned positive CARs around the first announcement of the event. The results are consistent with the findings of Jory and Madura (2009), as well as Hotchkiss and Mooradian (1998), which suggests that bidders who acquired bankrupt targets experience or earn positive CARs around the first announcement of the event.

Using the KZ-Index as one of the financial constraints prediction models, Meier and Servaes (2014) investigate the wealth impact of the fire sales of assets by financially

constrained firms on the wealth of the acquirer, as well as the factors that affect such wealth. They use data, which consists of 428 completed US M&As involving FCTs over the period 1982-2012, and they find that the cumulative abnormal returns (CARs) for bidders of FCTs are higher than bidders who bid for general acquisitions. Meier and Servaes (2014) do not differentiate between the M&A of bankrupt and non-bankrupt firms, and neither the M&A of financially constrained versus healthy targets. Their study is important as the finding suggest that the performance of bidders of M&A involving financial constraints targets is better than the bidders that acquired healthy targets.

Existing literature on the wealth effects of acquirers that acquire bankrupt/financially constrained targets can be summarized, first, according to the impact of M&As on announcement returns; second, on the long-term performance of an acquiring firm, and lastly on the discount or premium on the deal value.

Although studies on CARs surrounding the announcement date of bidders who acquired bankrupt/financially constrained targets are limited, most of the research on wealth creation has been primarily undertaken using event study methodology. This event study methodology involves the application of CARs to analyse the wealth creation of bidders surrounding the announcement dates. This is based on the proposition that, in an efficient market, the wealth effects around the announcement day reflects the capital market's overall unbiased assessment of the present value of the future benefits of the M&A (Datta *et al.*, 1992). This event study methodology relies on two assumptions to estimate the wealth effects of mergers: (a) the markets are efficient; and (b) the merger announcement about to be released by the merging firm is unknown to outside investors at the time of the announcement (Mulherin and Aziz Simsir, 2015).

Previous studies show that bidders who acquire bankrupt targets experience positive CARs around the day of the announcement (Clark and Ofek, 1994; Faelten and Vitkova, 2014; Hotchkiss and Mooradian, 1998; Jory and Madura, 2009, 2010; Jory *et al.*, 2012). Early studies in the field of M&A in resolving FCTs include Clark and Ofek (1994); Bruton *et al.* (1994); and Hotchkiss and Mooradian (1998).

Clark and Ofek (1994) examine 384 takeovers between the years 1981 and 1988 from W. T. Grimm and Associates' Mergerstat Review. They find that the success of the

restructuring process is negatively related to the premium size paid for the target by the bidders. The success of the restructuring process is also positively related to the financial constraints of the target. This finding could explain the rationale of engaging in M&A activity with targets that are either bankrupt or in a financially constrained condition. While Clark and Ofek (1994) find that takeovers involving bankrupt targets are not successful, the authors did not study the factors affecting the wealth effect of bidders that acquired bankrupt targets or FCTs. They find CARs of bidders to be positively and significantly related to the post-merger returns earned by bidders on their investments in the targets. Clark and Ofek (1994) provide evidence by taking a current and larger sample size. It also extends the previous study with the application of the Kaplan and Zingales Index (1997), to show the relationship between the short-term wealth effects, and the long-term wealth effects to the bidders of M&A involving bankrupt and FCTs.

Furthermore, Hotchkiss and Mooradian (1998) analyse the effects of acquisitions involving bankrupt targets and non-bankrupt targets. Their sample consists of 55 public companies that have filed for Chapter 11 between 1979 and 1992. Hotchkiss and Mooradian (1998) find that acquirers who acquire bankrupt targets show significant improvement in their operational performance, but there are no significant improvements for acquirers that acquired non-bankrupt targets. Hotchkiss and Mooradian (1998) also find positive and significant CARs for both bidders and bankruptcy targets for days surrounding the announcement of an acquisition. A study by Jory and Madura (2009) on the wealth effects of bidders that acquired bankrupt targets assesses and analyses 314 acquisitions of bankrupt assets in the US over the period of 1985-2006. They find that acquirers of bankrupt assets experience significant positive valuation effects, i.e., the mean 3-day CAR following the announcement is 2.40%. We extend the duration of the period from 1985 to 2012 with more M&As involving bankrupt targets. We compare the M&A of bankrupt targets with FCTs, using the KZ-Index.

There are connections between the financial conditions of targets and the wealth creation of bidders that need to be explored in more detail. Financially constrained firms are normally faced with future uncertainties and liquidity issues. Cooney *et al.* (2009)

examine returns to acquirers who purchase private targets who had previously withdrawn their IPOs. The authors argue that, under the assumption that managers are risk-averse and under-diversified, acquirer CARs should reflect the compensation for the transfer of uncertainty from the target to the bidder. Although the finding is consistent with Boone and Mulherin (2008), who claim that target valuation uncertainty positively affects the acquirer CARs, both studies do not make a comparison of the acquirer performance in the long-term. Indeed, both studies do not consider M&A activities involving bankrupt targets or FCTs. M&A are one of the ways in which firms can opt to reorganize their operations and restructure payments to their creditors, rather than file for liquidation, especially if they are in a state of financial distress. Nonetheless, the relationship between the bidders' returns and the financial uncertainty of targets is an element that needs to be explored in more detail. However, it should be explored in a different context, i.e. M&A activity involving bankrupt targets and FCTs.

The study by Khatami *et al.* (2015) on the role of financial constraint on M&A activity using data from 1985 to 2013, and of an announcement made in the US market, as well as a comparison of various measures to measure financial constraint, serves as a good platform for the development of this study. According to them, FCTs significantly increase acquisition premiums and CARs for both parties. Contrary to the current study where they only consider FCTs using the KZ-Index, we retain and analyse the 'universe' of US M&A deals from the Thomson One Deal Database. We also make a comparison between FCTs and healthy targets based on that index.

M&As reward target firm's shareholders, and yet they fail to deliver for bidder firms' shareholders (Gregory, 1997; Agrawal and Jaffe, 1999). Most of the explanations are based on the classic agency theory of Jensen and Meckling (1976) or managerial hubris hypothesis of Jensen and Ruback (1983) and Fuller *et al.* (2002). However, some of the studies show that M&A rewards both target firm shareholders as well as bidder firm's shareholders for the case involving financially constrained or bankruptcy targets. We would like to suggest a supplementary theory i.e., The Costly Signalling Theory to support the proposition of M&A involving FCTs and bankrupt targets creating value for the shareholders of bidders.

Spence (1973) first explained the Costly Signalling Theory, which states that if the cost of the signal is higher for the bad type than it is for the good type, then it is hard for other firms to copy, and so the signal can be regarded as being credible. Costly signalling theory proposes that expensive and often apparently subjective behavioral signals are designed to express honest information benefiting both signallers and observers (Zahavi 1975, Grafen 1990, Johnstone 1997).

We posit that when bidders make an announcement to acquire bankrupt or financially constrained targets, the cumulative abnormal return surrounding the announcement could be positive. Adopting the characteristics of the Costly Signalling Theory of behaviour by Smith and Bird (2000) should be beneficial to others. It will also be observable by others, but costly to the signaller in ways that cannot be mimicked or reciprocated. Furthermore, it will also be associated with some strength or fitness of the signaller (bidder). Bidding for bankrupt or financially constrained targets can also create the perception that the bidder is stable and willing to take the risk of acquiring problematic targets. Even though it is indirectly costly in terms of future uncertainty, it will also benefit the bidder indirectly by establishing a more positive reputation for them. This could result in a positive wealth creation to bidders surrounding the announcement date; as such announcements are positive signals to competitors and investors. Therefore, the wealth effects are presumably better for the bidders that acquire FCTs. Thus, we hypothesize that the positive market reaction to M&A announcements will be higher in M&A involving FCTs as compared to bidders of HTs.

> H_{1_a}: *Bidders that acquire bankrupt/financially constrained firms have a positive market reaction compared with bidders that acquire healthy firms.*

Based on past literature, we extend the study and examine the long run wealth effects of bidders. We also examine the wealth effects of bidders of fire sales with the discount received by acquiring financially constrained targets. Financially constrained targets may be forced to conduct fire sales at significant discounts from the asset value in order to increase the liquidity level to cover future debt repayments (Laamanen et al., 2014; Pulvino, 1998; Shleifer & Vishny, 1992). Oh, 2014 suggests that distressed targets

are sold at discounts when the target industry is in distress. Thus, the following sections will discuss in more detail the two aspects that we have highlighted.

2.2.2 Post-acquisition performance in response to bids for FCTs

It is well documented that the wealth valuation of acquirers of bankrupt targets have positive CARs on the day of announcement (Jory and Madura, 2009; Jansen and Stuart, 2014; Humphery-Jenner and Powell, 2011). There are few studies that attempt to examine the long-term effect of M&A involving bankrupt targets. Jory and Madura (2009) and Hotchkiss and Mooradian (1998) find that, in the long run, there is no significant difference in the performance between bidders that acquire bankrupt targets and non-bankrupt targets. Contrary to the findings by the Jory and Madura (2009) and Hotchkiss and Mooradian (1998), Bruton *et al.* (1994) claim that related acquisitions of FCTs perform better than unrelated acquisitions of financially constrained targets. Oh (2014) finds that acquirers of FCTs in a financially constrained industry tend to earn positive buy-and-hold abnormal returns (BHARs). The findings on the long-term wealth effects of bidders that acquired FCTs is mixed.

The application of the method to analyse the long run post-acquisition for M&A involving bankrupt targets and FCTs in previous studies is common (Barber and Lyon, 1997; Jory and Madura, 2009, 2010; Jory *et al.*, 2012; Oh, 2014). Jory and Madura (2009, 2010) and Jory *et al.* (2012) show that BHARs are not significantly different from zero for bidders that engage in asset purchases and acquisitions of equity of bankruptcy targets. They examine the wealth effects of bidders from M&A involving bankrupt targets. They find that there is wealth creation for bidders that acquired bankrupt targets in the short run, but not in the long run.

Furthermore, Oh (2014) shows that acquirers of FCTs in a financially constrained industry earn positive BHARs. The abnormal returns of acquirers in fire sale acquisitions are substantially higher than the returns of acquirers of FCTs in non-financially constrained industries in the same two-year window. The application of different models than those used by Oh (2014) may provide a better idea of the wealth effects of bidders that acquire bankrupt/FCTs. The study examines the wealth effects of M&A

activity over a longer period of a three-year window with well-known bankruptcy prediction models.

Jory & Madura (2009) find that the CARs of bidders of bankrupt targets are positive around the three-day announcement window but find no evidence of long run abnormal returns. We argue that in cases where bidders earn positive CARs around the announcement days, but fail to earn positive BHARs in the long run, they could be explained by the Rent-Seeking Theory. According to Latkov (2014, p.2):

> *…rent-seeking is defined as the attempt of individuals or groups to increase their welfare while making a negative contribution to the net society welfare. It means that some resources will not be consumed for productive purposes, but to the property rights structure change to the favor of individuals or groups to obtain them in the form of surplus rents.*

This application of rent-seeking theory is relevant when the top management is more interested in achieving short-term goals rather than in the long-term survival of the firm. Measuring market reaction over a three or four -day window surrounding the M&A announcement poses some challenges. The market reaction in the three or four days may be incomplete. If investors need time to assess the consequences of an M&A fully, then their valuation will be reflected in the stock price movements over a longer period. The long-term abnormal returns, in response to bids for financially constrained targets, are different compared to non-financially constrained targets. Thus, we also track bidders' share price performances over a longer period.

We apply the methods of buy-and-hold returns (BHRs) for financially constrained targets and buy-and-hold abnormal returns (BHARs) for bankrupt targets (Barber and Lyon, 1997). Jory and Madura (2009, 2010) and Jory *et al.* (2012), show that BHARs are not significantly different from zero for bidders that engage in asset purchases and acquisitions of equity of bankruptcy targets. However, Oh (2014) shows that acquirers of financially constrained targets in a financially constrained industry earn positive BHARs. Over the same two-year window, the abnormal returns of acquirers in fire sale acquisitions are substantially higher than the returns of acquirers of financially constrained targets in non-financially constrained industries. The application of different

models than those used by Oh (2014) would test the wealth effects of bidders that acquire bankrupt/financially constrained targets. We also try to examine the wealth effects of M&A activity over a longer period, i.e., a three-year window using robust bankruptcy prediction models.

In addition, in a competitive bid the winning bid may overpay to kill off other competing bidders, thus jeopardizing the long-term benefits to be derived from the acquisition. However, many would think that bidding for bankrupt or financially constrained targets is non-competitive for various reasons including lack of liquidity, asset specificity, bank covenants, low employee morale and other issues relating to the law in particular. Under these circumstances, a few bidders will have more time to properly assess the targets, especially if they belong to the same industry and/or the bidder has expert knowledge in the assets of the target firm. They lead to better evaluations and assessments of targets, and therefore will improve the long-term performance of the bidders. We hypothesise that because the deal value is normally below the market value, bidders will usually try to 'seal the deal' as quickly as possible to win the bid. Furthermore, the decision to acquire FCTs could be related to the Costly Signalling Theory, where it is only applicable in the short-term. However, in the long-term, the wealth creation to bidders is questionable. If bidders fail to create wealth from the acquisition of bankrupt and FCTs, then it could be due to the rent-seeking behaviour of the top management of the bidders.

Theoretically, other than filing for bankruptcy, there are other ways of identifying if a firm is financially constrained. There are bidders and specialist advisers who are experts in acquisitions of financially constrained targets (FCTs). They would use their expertise to identify FCTs with the potential to add wealth following an investment from an interested bidder. The restructuring would consume resources that the bidder can afford. We hypothesise that the M&A announcement returns would be positive for the bidder under these circumstances. Additionally, we expect the long-run outlook of the M&A to be favourable following the investments by the bidder to redress the business of the target firm. Conversely, the M&A is less likely to succeed if the bidder had other intentions as under the rent-seeking hypothesis.

We posit that the BHARs of bidders that acquire bankrupt or FCTs should earn negative BHARs. Coelho, John, & York (2012) reveal a statistically significant post-bankruptcy announcement drift of -28% over the following year for firms that remain listed on the main exchanges, which is relatively more negative when investors are more active, and the stocks exhibit speculative features. This is because the market reaction is not complete at the time of the M&A announcement. The motive of bidders is not clear in the short-term and there are more factors that investors cannot foresee at the time of the announcement. As these factors materialize over time, the performance of the bidder of the bankrupt targets or FCT will be seen in the long-term. Thus, we hypothesize as follows:

> H_{1_b}: *Bidders that acquire bankrupt financially constrained firms have negative buy-and-hold abnormal returns when compared with bidders that acquire healthy firms.*

The following hypothesis is related to the post-acquisition operating performance of bidders:

> H_{1_c}: *Bidders that acquire financially constrained firms have lower operating performances compared to bidders that acquire healthy firms.*

2.2.1.3 Deal value in M&A of bankrupt or financially constrained assets

Empirical research studies have shown the existence of fire-sale discounts bankruptcy (for instance, Pulvino (1998) and Campbell *et al.* (2011)). However, there is little evidence of its existence amongst financially-constrained targets that are not necessarily bankrupt. Most literature focuses on the losses suffered by sellers in fire-sale transactions, but little research has been done to examine the effect of fire sales on the wealth of the buyers of financially-constrained targets.

A fire sale is essentially a forced sale of an asset at a discounted price. The asset sale is forced in the sense that the seller cannot pay their creditors without selling off their assets (Shleifer and Vishny, 2011). By definition, fire sales are sales of goods at extremely discounted prices and normally happen when sellers are facing bankruptcy, or are in financially constrained conditions. Fire sales are said to occur in the financial market

when bidders that have highly valued assets are prevented from entering the bidding process. These will result in the price of the assets being sold at below the market prices. In this study, we test for the extent of fire-sales in M&As of FCTs.

Previous studies, such as Oh (2014), Hotchkiss and Mooradian (1998), Clark and Ofek (1994), Goergen and Renneboog (2004), and Bruyland and de Maeseneire (2014) examine the relationship between the financial condition of targets and the deal value of M&A. Financially distressed targets are sold at discounts when the target industry is in distress (Oh, 2014), and bankrupt targets are on average purchased at a 45% discount relative to prices paid for non-bankrupt targets in the same industry (Hotchkiss & Mooradian, 1998). There are also studies that examine the relationship between the deal value and characteristics of the targets, bidders and deals of M&As (Agrawal *et al.*, 2016; Alexandridis *et al.*, 2013; Madura and Ngo, 2008). Agrawal *et al.*, (2016) find that targets receive significantly higher acquisition premiums when they retain advisers. Madura and Ngo (2008) suggest that the deal value in a takeover is more closely associated with the recent premiums paid in previous takeovers in the target's corresponding industry. Alexandridis *et al.* (2013) results show that large firms are acquired at a significant discount relative to small ones. These studies (Agrawal *et al.*, 2016; Alexandridis *et al.*, 2013; Madura and Ngo, 2008) serve as the basis for the current study to apply the method of calculating the discount or premium in deal value in M&As involving FCTs.

It is a common practice that FCTs must sell their assets at a discount because of being in a desperate situation of liquidity or financial constraints. Their values are inversely related to the discount in deal values (Shleifer and Vishny, 2011). This gives the bidders the opportunity of acquiring bankrupt/financially constrained targets at a discounted value. Hotchkiss and Mooradian (1998) reveal that FCTs normally receive lower prices as they have less bargaining power due to their poor financial conditions. Additionally, financially constrained targets that are in a desperate situation to raise their liquidity level to cover their debt repayments may be forced to agree to a fire sales transaction. This may result in a significant discount in deal value (Lee and Madhavan, 2010; Pulvino, 1998). Moreover, financially constrained firms are more likely to be poorly managed as

compared to non-financially constrained firms and the discount in their deal values would constitute a price they need to pay for their inefficiency. The discounts in deal value will also be higher if FCTs have less bargaining power during the acquisition process.

Hotchkiss and Mooradian (1998) suggest that, on average, bankrupt targets are, on average purchased at a 45% discount relative to deal value paid for healthy targets in the same industry. When bankrupt assets have limited value on their own, they may become valuable when they are combined with another firm in the same industry and produce synergies (Jory and Madura, 2009). This pattern should be similar for the case of FCTs. As suggested by Jory and Madura (2009), acquisitions involving bankrupt targets in the same industry with acquirers are more favourable only if the selected assets are in the same industry. Bruton *et al.* (1994) report consistent findings and claim that related acquisition of FCTs perform better than unrelated acquisitions of FCTs. Previous researchers do not classify them as the drivers or determinants of the likelihood of acquirers to acquire FCTs over HTs.

Oh (2014) investigates how the combined effects of target firm and industry-level FCTs affect acquisition outcomes through the fire-sale channel. The author's sample consists of 1,627 completed mergers between US non-bankruptcy public targets and US public bidders between 1980 and 2010. Oh claims that FCTs are sold at a discounted price when the target industry is financially constrained. In this essay, we compare the prices (in the form of M&A discounts) between financially constrained targets (FCTs) and healthy targets (HTs). Differences in the prices paid would confirm the existence of a fire-sale in the acquisitions of FCTs.

We perform the above in this paper by comparing deal values in M&As involving FCTs versus HTs. Oh's (2014) findings that there are fire-sales in M&As involving firms that are in FCTs is consistent with Clark and Ofek (1994), Hotchkiss and Mooradian (1998), and Goergen and Renneboog (2004). Valuation discounts tend to be positively related to the degree of information asymmetry between acquirers and targets (Agrawal *et al.*, 2016). In a situation where market participants are liquidity-constrained, prices become less informative (Dow and Han, 2016). While there is evidence to suggest that FCTs are

sold at a discounted price when the target industry is financially constrained (Oh, 2014), however the discounts are mostly due to the diligent assessment undertaken by the bidder prior to the M&A. Additionally, there is the risk that FCTs would window-dress their financial statements (Hu and Sathye, 2015). This creates information asymmetry between the bidders and targets, which would explain the discounts in the deal's value between an M&A involving FCTs.

The deal value of the M&A of healthy targets is different from the deal value of the M&A involving financially constrained targets, or bankrupt targets. Shleifer and Vishny (2011) predict that firms with financial constraints will have to sell off their assets at a discount as a result of being in a dire liquidity situation. Financial constraints and firm value are inversely related, which gives the bidders the opportunity to acquire bankrupt/FCTs at a discount value. The propensity of FCTs that need to raise liquidity at short notice to agree to a fire sales transaction is high, which would result in a significant discount in the deal value (Lee and Madhavan, 2010; Pulvino, 1998). FCTs are more likely to be poorly managed, an inefficiency that could explain how they became financially constrained in the first place. The discounts in deal value will also be higher if financially constrained targets have less bargaining power due to their adverse financial condition. If this is the case, then the deal value of an M&A involving financially constrained targets will be below the deal value of healthy targets. This is because non-financially constrained targets are more stable, and are not in the process of restructuring their operations.

However, Khatami *et al.* (2015) suggest that acquisition premiums are significantly higher when targets are financially constrained. Their findings contradict Clark and Ofek (1994), Hotchkiss and Mooradian (1998), Goergen and Renneboog (2004) and Oh (2014). Although Khatami *et al.* (2015) use multiple methods to classify FCTs, yet their findings are more related to bidder characteristics than target ones. What Khatami *et al.* (2015) find from their analysis is that the M&A involving financially constrained targets would normally increase the acquisition premium, whereas we postulate that M&As involving financially constrained targets will normally be at a discount resulting from fire-sales. Agrawal *et al.* (2016) find that targets that have advisers will normally enjoy

an acquisition premium. Alexandridis *et al.* (2013) find that a premium is negatively related to the target's size. These two studies presage that the premium paid to targets is not only related to the financial condition of the target, but may reflect other determinants. We argue that a comparison of the premiums paid for FCTs versus HTs is important to establish the existence of a premium or a discount in M&As of FCTs.

To this end, we test the M&A premium in acquisitions of bankrupt assets against the M&A premium paid for similar firms that are not bankrupt or financially constrained. We hypothesize that the deal value of FCTs is lower than comparable firms that are not financially constrained.

Prior to acquisition, acquiring managers sometimes overestimate targets future values (they suffer from managerial hubris (see eg., Goergen & Renneboog, 2004; Malmendier & Tate, 2008; Roll, 1986)) and overestimate the potential synergies of business combinations (John and Ofek, 1995; Lippman and Rumelt, 2003). These managers are more likely to overpay for a target. According to Bruton *et al.* (1994), overestimating a target's value is less likely when an acquisition target is a financially constrained firm and in a business related to the bidder, i.e., within the same industry.

Furthermore, valuation discounts tend to be positively related to the degree of information asymmetry between the acquirers and targets (Agrawal *et al.*, 2016), which is likely to exist among liquidity-constrained market participants (Dow and Han, 2016).

Valuation discounts tend to be positively related to the degree of information asymmetry between the acquirers and targets (Agrawal *et al.*, 2016). Financially constrained targets are sold at discounted prices when the target industry is financially constrained (Oh, 2014) or in a situation where market participants are liquidity-constrained (Dow and Han, 2016). Bidders may take precautions steps and processes prior to M&A to prevent from overpayment. Targets that could potentially experience financial constraints in the near future may window-dress their financial statements (Hu and Sathye, 2015). This creates information asymmetry between the bidders and targets. This in turn will create discount in the deal's value between an M&A involving FCTs. Hence, we put forward our last hypothesis as follows:

H_{1_a}: *The M&A premium is inversely related to a target's degree of financial constraints.*

2.3 Sample Selection and Data Description

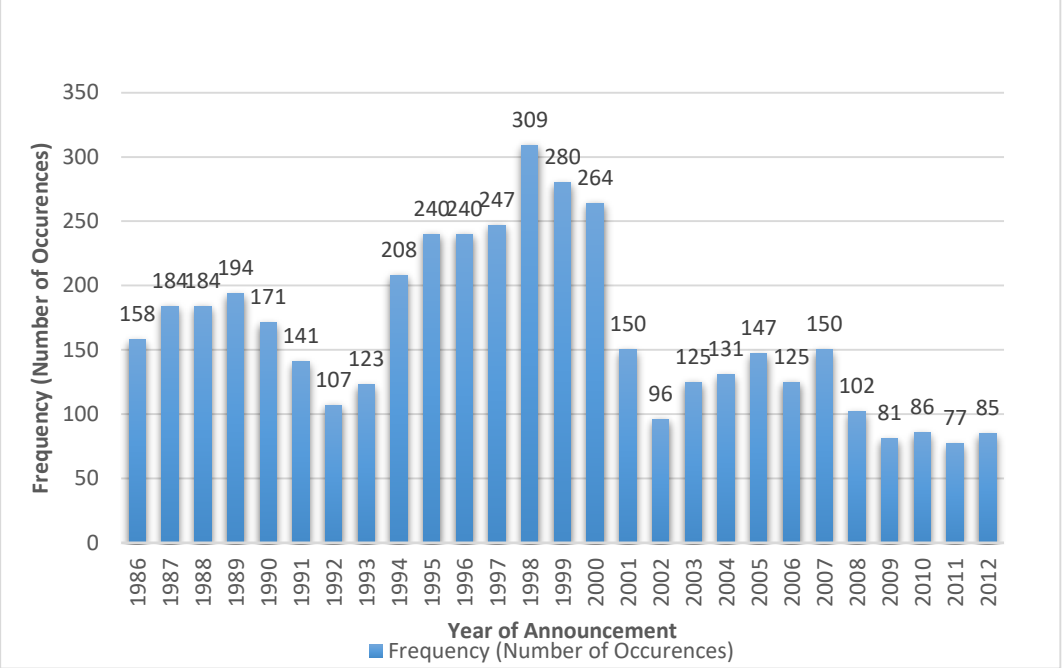
Our study collects a sample of M&A announcements made between 1985 and 2012 from the Thomson One Deal database. We consider only completed M&A in our study. Although this study is about firms that are in financial constraints, we have downloaded the universe of M&A transactions from the Thomson One Deal database. Our objective is to compare the performance of acquisitions of financially constrained firms with the acquisitions of non-financially constrained firms. We also have collected the whole dataset on the M&A involving bankrupt targets for the robustness test in our analysis. The bidders are US public firms and the targets are US public, private, or subsidiary firms. We require that bidders must have data in the CRSP database to calculate the announcement periods returns, buy-and-hold returns, and discount/premium data.

To assess the financial condition of target firms we use several methods. We first use the Kaplan and Zingales Index (1997) model in identifying targets that are financially constrained. The final dataset for the M&A involving financially constrained targets contains 4,405 observations, and 407 observations for M&A involving bankrupt targets. The event date is the first announcement date of the takeover by a successful bidder. Accounting and financial data are obtained from COMPUSTAT. All databases are accessed via Wharton Research Data Services (WRDS). To compute Cumulative Abnormal Returns (CARs) and Buy-and-Hold Abnormal Returns (BHARs), we use the Eventus database.

We eliminate financial firms with SIC codes 6000-6999, and utility firms with SIC codes 4900-4999, because they are highly regulated firms. We include only deals that are complete and where the amount of the deal value is reported. We consider only domestic deals and ignore cross-border ones. Bidder firms are listed either on the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), or NASDAQ. To determine the financial status of a firm (i.e., whether it is financially constrained or not), we require the firm to be publicly incorporated. For the bankrupt database, we consider the entire universe of M&A in the US. For a clearer picture of the sample distribution of

this study, we present the frequency per year of announcement in Figure 2-1 for financially constrained targets, and in Figure 2-2 for M&As involving bankruptcy targets.

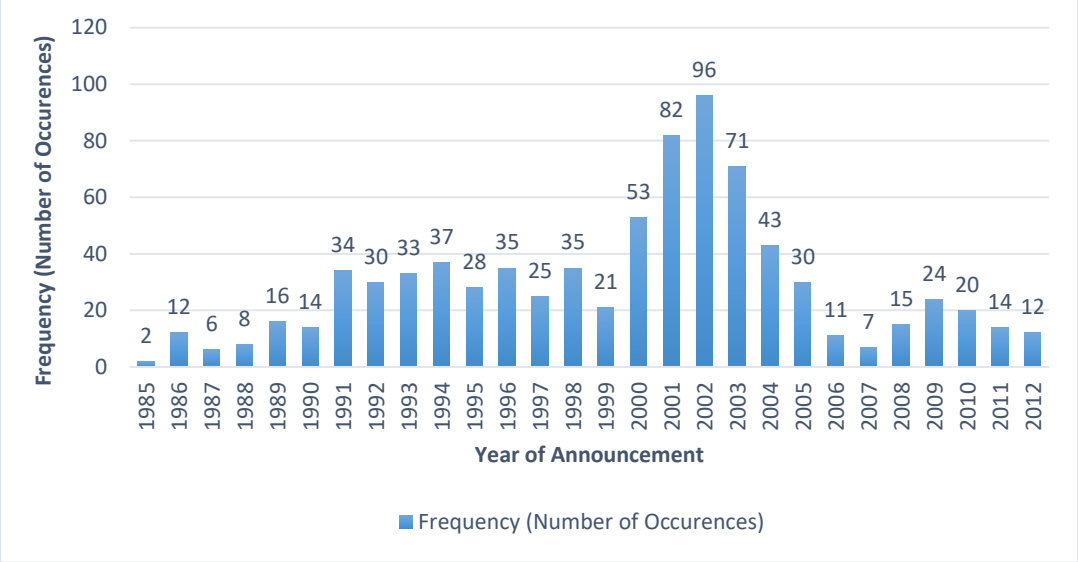
Figure 2.1: Frequency of M&A involving FCT



Source: Compiled by author from data obtained from Thomson One Banker

For a clearer picture of the sample distribution of this study, we present the frequency per year of announcement in Figure 2.1 for financially constrained targets, and in Figure 2.2 for M&As involving bankruptcy targets. The highest number of M&A involving FCT in our study is in the year 1998 and the lowest in in the year 2009. Whereas for the sample involving bankrupt targets, the highest number is for the year 2002 and the lowest is in 1985. It seems that, more M&A involving FCT and bankrupt targets during the tech bubble period. However, there is no obvious pattern during the global world financial crisis. There is a reduction in the number of M&A involving FCT from 2007 to 2008. Unlike, there is an increment in the M&A involving bankrupt targets from 2007 to 2008. The pattern of M&A involving FCT is relatively decreasing immediately after the introduction of SOX in 2002. Nevertheless, there are slight increases for a few years after the introduction of SOX in the M&A involving FCT from 2002 onwards.

Figure 2.2: Frequency of M&A involving bankruptcy target



Source: Compiled by author from data obtained from Thomson One Banker

In Table 2.1 the sample distribution is based on the year of announcements. The highest number of M&A was in the year 1998, with 309 M&A (7.01% of the total sample). The second highest number of acquisitions was in 1999, with 280 M&A involving financially constrained targets, which equals to 6.36% of the total number of 4,405 M&A in the period of analysis. The minimum number of M&A was in the year 2011. There were only 77 M&A in the year 2011, i.e., 1.75% of the overall sample. In 1985, there are no observations available for us to apply the Kaplan and Zingales (1997) Index to and to analyse.

For further analysis in the later chapters, we will use the four quartiles to classify the targets into financially constrained and healthy targets. The distribution of the quartiles is presented in Table 2.3. Based on the KZ-Index, a high index score of a firm means the firm is highly constrained. Thus, the higher the index, the more financially constraint the firm is. We classify the index of all the sample firms into quartiles. We classify the percentage of highly safe firms in the first quartile, and the highly financially constrained firms in the fourth quartile.

Table 2.1: Sample Distribution of M&A Involving Financial Distressed Targets*

	FCT		BANKRUPTCY	
Year of Announcement	N	%	N	%
1985	0	0	2	0.25
1986	158	3.59	12	1.47
1987	184	4.18	6	0.74
1988	184	4.18	8	0.98
1989	194	4.40	16	1.97
1990	171	3.88	14	1.72
1991	141	3.20	34	4.18
1992	107	2.43	30	3.69
1993	123	2.79	33	4.05
1994	208	4.72	37	4.55
1995	240	5.45	28	3.44
1996	240	5.45	35	4.3
1997	247	5.61	25	3.07
1998	309	7.01	35	4.3
1999	280	6.36	21	2.58
2000	264	5.99	53	6.51
2001	150	3.41	82	10.07
2002	96	2.18	96	11.79
2003	125	2.84	71	8.72
2004	131	2.97	43	5.28
2005	147	3.34	30	3.69
2006	125	2.84	11	1.35
2007	150	3.41	7	0.86
2008	102	2.32	15	1.84
2009	81	1.84	24	2.95
2010	86	1.95	20	2.46
2011	77	1.75	14	1.72
2012	85	1.93	12	1.47
Total	4405	100.00	814	100

*Year of Announcement.

Source: Compiled by author from data obtained from Thomson One Banker

The percentages of these two extreme quartiles are almost the same, i.e., 24.63% and 24.99% respectively. Most firms fall under the second quartile. There are 1,115 M&A involving healthy targets, or 25.31%, that are considered to be in the first quartile. The second largest were 1,104 M&A involving financially constrained targets, or about 25.06% out of the total M&A in the sample based on the KZ-Index. We present some of the descriptive statistics of the variables we use in our analysis in Table 2.4 for better understanding of the sample. The next section is a discussion on the measurement used to define our target sample.

Table 2.2: Distribution of Targets (FCTs?)*

Number of Targets Based on Kaplan-Zingales Index (1997)	N	%
1st Quartiles	1085	24.63
2nd Quartiles	1115	25.31
3rd Quartiles	1104	25.06
4th Quartiles	1101	24.99
Total	4405	100.00

*Financial data taken two years before the announcement (Based on Kaplan-Zingales Index 1997)

Source: Compiled by author from data obtained from Compustat

2.3.1 Measuring financial constraints

The literature has proposed several models and criteria to identify the degree of financial constraints faced by firms. The initial study to identify the degree of financial constraints is undertaken by Fazzari *et al.* (1988). However, there is no consensus on the best measures available (Khatami *et al.*, 2015). We compute the degree of financial constraints of targets based on the KZ-Index following Lamont *et al.* (2001) and Khatami *et al.* (2015). The KZ-Index is a relative measurement of reliance on external financing for non-financial firms. Companies with higher KZ-Index scores are more likely to experience difficulties when financial conditions tighten, since they may have difficulty financing their on-going operations. Even though it cannot be precisely predicted which companies are financially constrained and which are not, it is helpful for the current researchers to gauge the standing of the firms. The KZ-Index is based on the following five-factor model as described in Lamont *et al.* (2001):

$$KZ\ index_i = -1.001909\left(\frac{Cash\ Flow_t}{PPE_{t-1}}\right) + 0.2826389\ Q_i + 3.139193\left(\frac{Debt_t}{\frac{Debt_t}{Book\ Equity}_t}\right) - 39.3678\ \left(\frac{Dividends_t}{PPE_{t-1}}\right) - 1.314759\ (\frac{Cash_t}{PPE_{t-1}}) \quad (2.1)$$

Where KZ index is consists of five elements. Cash flow is computed as EBITDA; Q is computed as (Book Assets – Book Equity – Deferred Taxes + Market Equity) / Book Assets; and Debt is computed as Long-term Debt + Debt in Current Liabilities. PPE is the start-up total cost of plant, property and equipment of the firm. This index captures the

extent to which other firms in the industry are capital constrained. A higher index means that the firm is more financially constrained.

We retrieved all the elements in the equation 2.1 from COMPUSTAT. These variables will form into five independent ratios. The data are taken two or three years before the year that the firms listed in the Thomson One Deal database. The general rule of applying this index is that the higher the index means the firm is highly constrained.

However, the current researchers divide the index into four quartiles, having the first quartile as a safe set of targets and the last quartile as the set of targets that are highly constrained targets. For the robustness check we also consider the third and the fourth quartiles as the set of M&A involving FCT as well in our analysis. As has been explained in the previous chapters, the current researchers are interested in examining the M&A involving the FCTs. We use the quartiles when categorizing the targets.

We use the Heckman Selection Model (HSM) to control for endogeneity. This method is appropriate because we have a non-random sample selection, i.e., bidders' performances are only observed for targets that accepted an offer. Hence, our estimator could be biases since we do not know what the outcome would be for those targets that refused a bidder's offer. To control for the sample selection bias, we predict the likelihood of a target firm accepting a bidder's offer at the first-stage of HSM using a probit model. We calculate the predicted inverse mills ratio (IMR) for each M&A transaction in the first-stage of HSM, and in the second-stage HSM, we estimate the bidders' performances using the IMR as a predictor in the model (see Maddala, 1983; Wooldridge, 2009). To test our hypotheses regarding characteristics that influence acquirers to choose FCTs, we apply the first-stage HSM probit regression to the following model:

$$\begin{aligned} ln\frac{v}{1-p} = \alpha + \beta_1 DEBTRATIO_i + \beta_2 ICR_i + \beta_3 SIZE_i + \beta_4 RELATED_i \\ + \beta_5 CRISIS_i + \beta_6 SOX_i + \beta_7 ALLCASH_i + \beta_8 FRIENDLY_i \\ + \beta_9 ACCOUNT_i + \beta_{10} SIZETARGET_i + \beta_{11} ACA_i \\ + \beta_{12} TENDEROFFER_i + \beta_{13} MULTIPLEBID_i \\ + \beta_{14} MAACTIVITY_i + \beta_{15} TACOUNT_i + \beta_{16} COMPLETION_i \\ + \beta_{17} TECHTARGETt_i + \beta_{18} TECHBIDDER_i + \varepsilon_i \end{aligned} \quad (2.2)$$

The binary response (i.e., outcome or dependent) variable is assigned a value of one when the target is classified as financially constrained, and 0 if the target is a healthy

firm; Where the binary response (i.e., outcome or dependent) variable is assigned a value of one when the target is classified as financial constraints, and zero if the target is a healthy firm; *DEBTRATIO* is the bidder's total liabilities divided by market value of equity, as of four weeks prior to the announcement; *ICR* is the interest coverage ratio of the bidder calculated as EBIT divided by interest expenses; *SIZE* is the log of book value of total assets of the bidder; *RELATED* is equals to one if the buyer's and target's SICs are equal at the two-digit level; *CRISIS* is a dummy variable that takes a value of one for years 2008, 2009, 2010, 2011 and 2012 and zero otherwise; *SOX* is a dummy variable that takes a value of one for years from 2002 onwards and zero otherwise; *ALLCASH* is equals to one if the deal is financed by all cash; *FRIENDLY* is equals to zero if the bid status is friendly and one if hostile; *ACCOUNT* is equals to number of bidder's advisor; *SIZETARGET* is the log of book value of total assets of the target; *ACA* is equals to one if the bidder only acquired certain assets only and zero if otherwise; *TENDEROFFER* is equals to one if the deal is tender offer and zero if otherwise; *MULTIPLEBID* is equals to number of bidders; *MAACTIVITY* is equals the logarithm of total value of the mergers and acquisition in the same year; *TACOUNT* is equals to number of target's advisor; *COMPLETION* is measured as the number of days between deal closing and announcement date; *TECHTARGET* is equals one if the target is a high-tech firm; and *TECHBIDDER* is equals one if the bidder is a high-tech firm and zero if otherwise. We control for year fixed effects, as well as robust standard errors. We estimate the effect of the financial health of targets on the CARs, BHRs, ROA and discount, subsequently using the following model of the second-stage HSM:

$$CAR_i = \alpha + \beta_1 FC_i + \beta_2 PREMIUM_i + \beta_3 FC_i * PREMIUM_i + \beta_3 CONTROL_i + \beta_4 IMR_i + \varepsilon_i \quad (2.3)$$

$$BHR_i = \alpha + \beta_1 FC_i + \beta_2 PREMIUM_i + \beta_3 FC_i * PREMIUM_i + \beta_3 CONTROL_i + \beta_4 IMR_i + \varepsilon_i \quad (2.4)$$

$$ROA_i \text{ or } \Delta ROA_i = \alpha + \beta_1 FC_i + \beta_2 PREMIUM_i + \beta_3 FC_i * PREMIUM_i + \beta_3 CONTROL_i + \beta_4 IMR_i + \varepsilon_i \quad (2.5)$$

$$PREMIUM_i \; or \; DISCOUNT_i = \alpha + \beta_1 FC_i + \beta_2 PREMIUM_i + \beta_3 FC_i * PREMIUM_i + \beta_3 CONTROL_i + \beta_4 IMR_i + \varepsilon_i \quad (2.6)$$

CAR_i is the cumulative abnormal return of an acquirer in the sample; FC_i is equal to one if the M&A involves FCTs, and 0 if the target is a healthy target. $Control_i$ is all the independent variables used in the first-stage probit regression. IMR_i is the inverse mill ratios generated from the first-stage HSM probit regression. BHR_i is the buy-and-hold return of the firm in the sample. ROA_i is the return on assets calculated as the net income divided by total assets. *ΔROA* is the changes in the *ROA* calculated as $ROA_{i,t}$ minus $ROA_{i,t-1}$ divided by $ROA_{i,t-1}$. $PREMIUM_i \; or \; DISCOUNT$ is the percentage of the deal value divided by the targets market value four weeks prior to the announcement.

To the extent that bidders alleviate the financial constraint of the target firms and enable them to finance their desired investments, as well as to reduce their costs of capital, it is conceivable that this improved state of affairs will reflect positively on a bidder's performance, now that the target is part of the combined entity. To test this hypothesis, we compare the Return on Assets (ROAs) between bidders of constrained and unconstrained firms.

Heckman (1979) states that the self-selection sample produces a specification error that leads to biased estimators. The two-stage method is used to mitigate the biases and to control the selection bias. In our t-test and Wilcoxon test results, we report the difference in mean and median of the performance and the wealth effects of the bidders between the different groups of our examinations. Therefore, we employ a two-stage Heckman method to confirm that selection bias does not affect our regression models. We use the financial constraints (FC) of the targets to run the first-stage probit regressions. These variables are presented in the first and the third columns in every regression table presented in this study. From the first-stage regression, we calculate the inverse mills ratio and use it in our second-stage regressions. The coefficient of the *IMR* is always insignificant for the case of CARs and BHRs. This means that selection bias does not affect our findings. We will discuss the analysis in detail in the next section.

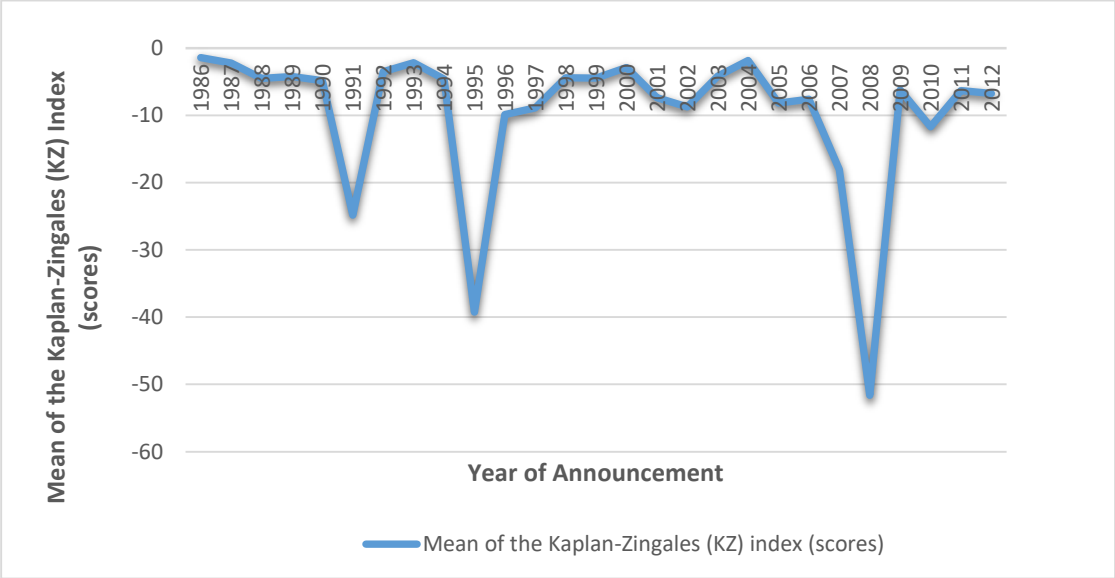
2.4 Empirical results

The results are presented at two levels: first a discussion of the univariate analysis of the M&A involving FCTs is undertaken in light of the effect of financial constraints on firm performance. That discussion also encompasses the first-stage of HSM. In the second part, a multivariate analysis is undertaken to highlight the effect of financial constraints on the wealth creation of bidders.

2.4.1 Univariate analysis

M&A involving FCTs or healthy targets differ significantly from each other. Figure 2.3 represent the lines graph of KZ Index Mean.

Figure 2.3: Lines Graph of Mean of the Kaplan- Zangales (KZ) Index (scores)



Source: Compiled by author from data obtained from Compustat database

From the graph, it shows that the KZ index mean of the sample targets is the lowest in the year 2008 and the highest is in the year 1986. The average KZ-Index in 2008 is -51.61 and in 1986 is -1.43. The average KZ-Index of the sample targets is -9.66. This index captures the extent to which other firms in the industry are capital constrained. Firms with higher KZ-Index scores are more likely to experience difficulties financing their ongoing business. In our opinion, the KZ-Index mean of the sample targets is the lowest during the global financial crisis in 2008 could be due to the due diligence and cautious behaviour among bidders during that period.

Table 2.4 reports the descriptive characteristics of variables used in this study. The univariate results are presented in Table 2.5 where Panel A represents the CARs of bidders of financially constrained targets, which fall into the fourth quartile based on the KZ-Index. The 3-day event window (-2, 0) represented in the table shows that the CARs of bidders are positively significant and not equal to 0 at 5% significant level. Comparing the first and the fourth quartiles of the targets based on the KZ-Index, where the fourth quartile represents the bidders that acquired FCTs, the t-test shows that the means of the CARs of bidders that acquired financial constraints are not equal to zero.

Table 2.3: Data Descriptive Statistics of M&A Involving FCTs*

	N	Mean	Median	Stdev
Kaplan Zingales Index (1997)-overall	4,405	-9.308***	1.105***	98.526
Kaplan-Zingales Index (1997				
-1st Quartiles	1085	-43.078***	-9.233***	194.637
-2nd Quartiles	1115	-0.518***	-0.314***	1.115
-3rd Quartiles	1104	1.997***	2.045***	0.468
-4th Quartiles	1101	3.733***	3.205***	5.360
CAR (-2,0)	4405	0.300***	0.200	7.000
CAR (-3,0)	4405	0.400	-0.100	8.600
BHR (+1, +12)	4405	16.800***	8.100	61.700
BHR (+1, +36)	4405	37.000***	8.500***	146.300
Return on Assets				
ROA_{t+1}	4070	0.007	0.049***	0.400
ROA_{t+2}	3756	0.002	0.046***	0.645
ROA_{t+3}	3696	-0.001	0.043***	0.518
ROA_{t+1}-Industry median adjusted	4068	0.002	0.031***	0.399
ROA_{t+2}-Industry median adjusted	3754	0.005	0.032***	0.645
ROA_{t+3}-Industry median adjusted	3693	0.003	0.028***	0.518
Discount/Premium	4005	12.868	-1.693***	587.289
Debtratio	4250	1.234***	0.989***	9.281
ICR	3813	45.935***	5.336***	470.833
SIZE	4263	6.584***	6.616***	2.225
Sizetarget	4405	5.616***	5.420***	2.055
Tobin's Q	4370	2.160***	1.604***	2.509
Completion	4405	169.971***	92.000***	282.696

* Descriptive Statistics of Continuous Variables (Based on Kaplan-Zingales Index 1997).

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

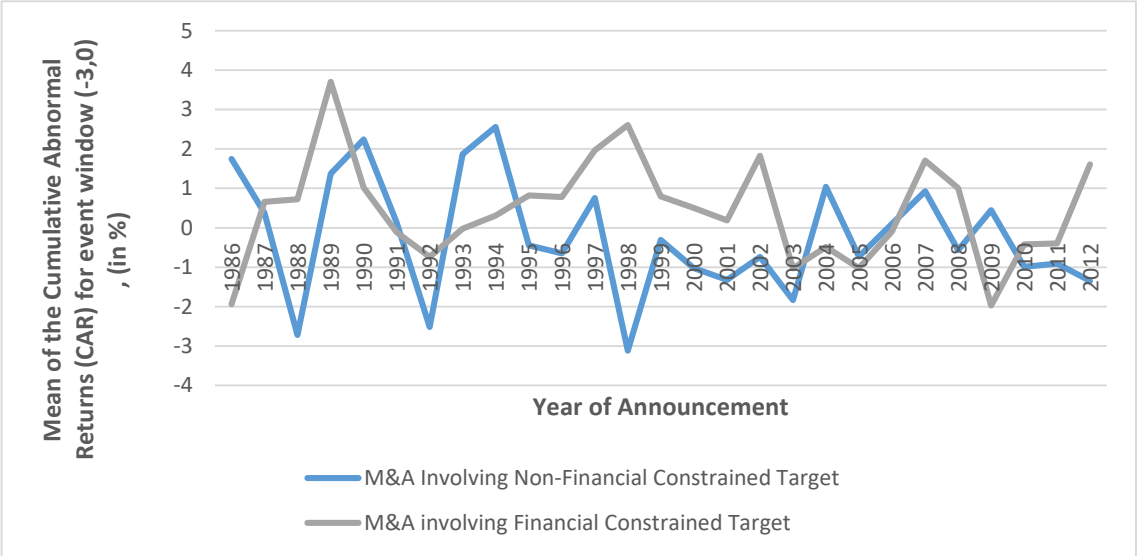
Source: Compiled by author from data obtained from CRSP and COMPUSTAT

Figures 2.4 shows the line plot of the mean CAR (-3,0) for both the FCT and non-FCT. The FCT are those firms classified in the first quartile and the non-FCT are those firms fall under the fourth quartile. From the line plot of Figure 2.4, the mean CAR (-3,0) of non-FCT is seems to be lower than the mean of FCT in most of the periods. The mean

CAR (-3,0) of FCT in year 2008 is higher than the mean CAR (-3,0) for bidders that acquired healthy targets.

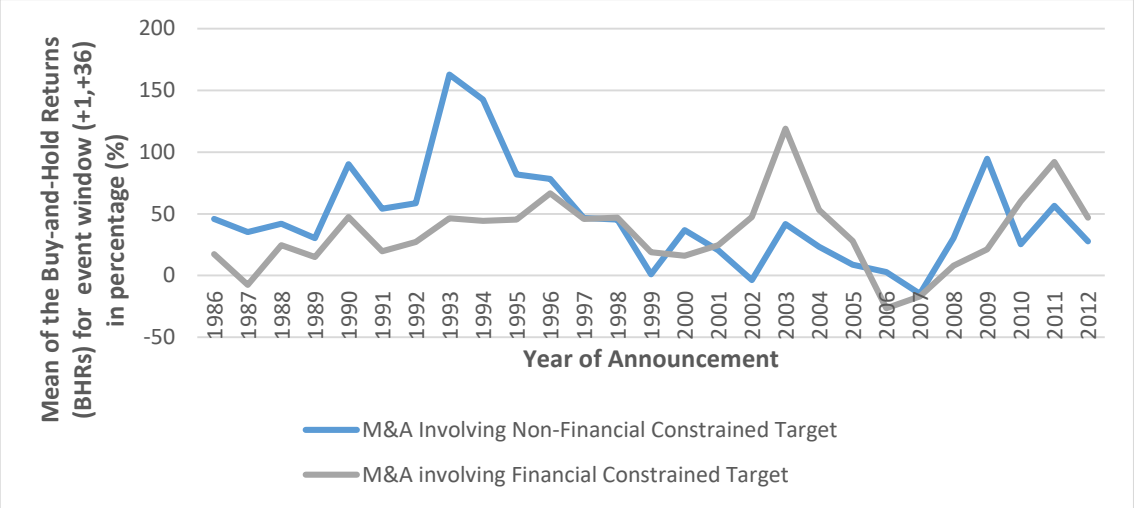
Figure 2.5 represent the line plot for BHR (+1, +36) of the bidders that acquired FCT and non-FCT. It is clear that the BHR of the bidders that acquired non-FCT to earn higher BHR (+1, +36) from the year 1985 to 1997 as well as the year 2008. However, the BHR (+1, +36) of bidders that acquired non-FCT is lower for the post-financial crisis is especially in year 2010 onwards. BHR (+1, +36) of bidders that acquired FCT is also higher for the period of 2002 to 2005.

Figure 2.4: Line Plot of Mean of the Cumulative Abnormal Returns (CAR) for event window (-3, 0) – M&A Involving Financial Constrained Targets and Non-Financial Constrained Targets



Source: Compiled by author from data obtained from CRSP

Figure 2.5: Line Plot for Buy-and-Hold Returns (BHR) for event window (+1, +36) – M&A Involving Financial Constrained Targets and Non-Financial Constrained Targets



Source: Compiled by author from data obtained from CRSP

Table 2.4: Univariate analysis of CARs, BHRs, ROAs and Discount/Premium of FCTs versus healthy acquisitions

	N	Mean	Median
Panel A: The Effects of Financial Health of Target on CARs (-2,0) of Bidders			
4th Quartile versus 1st Quartile			
Bidder of FCTs (4th Quartile)	1,101	0.005**	0.002
Bidder of non-FCTs (1st Quartile)	1,085	-0.001	0.002***
Difference		0.005	-0.000
t-stat/Wilcoxon		1.680*	-0.060
3rd and 4th Quartiles versus 1st Quartile			
Bidder of FCTs (3rd and 4th Quartiles)	2,205	0.007***	0.002***
Bidder of non-FCTs (1st Quartile)	1,085	-0.001	0.002***
Difference		0.008	0.000
t-stat/Wilcoxon		2.800***	1.395
Panel B: The Effects of Financial Health of Target on CARs (-3,0) of Bidders			
4th Quartile versus 1st Quartile			
Bidder of FCTs (4th Quartile)	1,101	0.007***	-0.001
Bidder of non-FCTs (1st Quartile)	1,085	-0.003	-0.001
Difference		0.010	0.000
t-stat/Wilcoxon		2.580***	1.889*
3rd and 4th Quartiles versus 1st Quartile			
Bidder of FCTs (3rd and 4th Quartiles)	2,205	0.008***	0.000
Bidder of non-FCTs (1st Quartile)	1,085	-0.003	-0.001
Difference		0.011	0.001
t-stat/Wilcoxon		3.290***	2.416**
Panel C – The Effects of Financial Health of Target on BHRs (+1,+36) of Bidders			
4th Quartile versus 1st Quartile			
Bidder of FCTs (4th Quartile)	1,101	0.359***	0.049
Bidder of non-FCTs (1st Quartile)	1,085	0.426***	0.071***
Difference		-0.067	-2.140

t-stat/Wilcoxon		-0.980	-1.089
3rd and 4th Quartiles versus 1st Quartile			
Bidder of FCTs (3rd and 4th Quartiles)	2,205	0.353***	0.061***
Bidder of non-FCTs (1st Quartile)	1,085	0.426***	0.071***
Difference		-0.73	-0.010
t-stat/Wilcoxon		-1.290	-0.760
Panel D - The Effects of Financial Health of Target on Median Industry-Adjusted ROAs of Bidders			
Industry Median Adjusted $ROA_{y_{t+1}}$			
4th Quartile versus 1st Quartile			
Bidder of FCTs (4th Quartile)	1,005	-0.020**	0.015***
Bidder of non-FCTs (1st Quartile)	986	0.013	0.047***
Difference		-0.033	-0.032
t-stat/Wilcoxon		-2.50**	-9.024***
3rd and 4th Quartiles versus 1st Quartile			
Bidder of FCTs (3rd and 4th Quartiles)	2,030	-0.007	0.019***
Bidder of non-FCTs (1st Quartile)	986	0.013	0.047***
Difference		-0.020	-0.028
t-stat/Wilcoxon		-1.920*	-9.270***
Industry Median Adjusted $ROA_{y_{t+2}}$			
Bidder of FCTs (4th Quartile)	919	-0.036	-0.036
Bidder of non-FCTs (1st Quartile)	914	0.016***	0.046***
Difference		-0.053	-0.082
t-stat/Wilcoxon		-1.260	-8.334***
3rd and 4th Quartiles versus 1st Quartile			
Bidder of FCTs (3rd and 4th Quartiles)	1,856	-0.014	0.021***
Bidder of non-FCTs (1st Quartile)	914	0.016	0.046***
Difference		-0.030	-0.025
t-stat/Wilcoxon		-1.020	-8.444***
Industry Median Adjusted $ROA_{y_{t+3}}$			
Bidder of FCTs (4th Quartile)	903	-0.017**	0.015***
Bidder of non-FCTs (1st Quartile)	890	0.018*	0.042***
Difference		-0.035	-0.027
t-stat/Wilcoxon		-2.770***	-7.634***
3rd and 4th Quartiles versus 1st Quartile			
Bidder of FCTs (3rd and 4th Quartiles)	1,824	-0.013*	0.017***
Bidder of non-FCTs (1st Quartile)	890	0.018*	0.042***
Difference		-0.030	-0.025
t-stat/Wilcoxon		-2.580***	-7.830***
Panel E- The Effects of Financial Health of Target on Discount/ Premium on the Deal			
4th Quartile versus 1st Quartile			
Bidder of FCTs (4th Quartile)	977	4.3698*	-1.503***
Bidder of non-FCTs (1st Quartile)	1,016	38.937	-1.711***
Difference		-34.567	-0.792
t-stat/Wilcoxon		-0.930	-2.181**
3rd and 4th Quartiles versus 1st Quartile			
Bidder of FCTs (3rd and 4th Quartiles)	1,977	3.502**	-1.662***
Bidder of non-FCTs (1st Quartile)	1,016	38.937	-1.711***
Difference		-35.434	0.049
t-stat/Wilcoxon		-1.350	1.511

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Source: Compiled by author from data obtained from COMPUSTAT and CRSP

The univariate tests of the comparison between the two classes of targets based on the KZ-Index shows significant difference at the 10% level between the two classes for event windows, except for window (-2,0). The results show that the bidders of FCTs earn more than bidders that acquired healthy targets. There is no significant difference between BHRs for (+1, +36), but the figures are positive. In comparing the ROA between bidders that acquired FCTs and healthy targets, a significant difference is shown between the two groups. The difference between the ROA from t+1 to t+3 shows a positive and significant result at the 1% level.

When comparing between the industry median adjusted ROA, our results show a different pattern. The ROA of bidders that acquired FCTs earn less based on t-test results for the ROA one year after the announcement. However, the t-test result shows a positive and significant result at the 5% level for year t+3. The Wilcoxon-test of the median shows a negative and significant result at the 1% level. This means that bidders that acquired FCTs earn less than bidders that acquired healthy targets post-acquisition. From Table 2.4, we can see that the FCTs received a premium instead of a discount on the deal. The difference is positive and significant at the 1% level.

Before we examine the effect of financial constraints in targets on the wealth creation and discount in deals, we examine the characteristics of targets and bidders on the M&A involving the FCTs. We present a Pearson correlation matrix among the independent variables in probit regression (first-stage) (please refer to Appendix 2, on page 206). The results indicate all the independent variables are low and moderately correlated which confirms multicollinearity is not a problem. The correlations are low to moderate, between -0.02 and 0.69. We are therefore confident that the variables provide sufficient independent information and that multicollinearity is not an issue (Cohen and Cohen, 1983). To assess for severity of multicollinearity in the regressions, we compute variance inflation factors (VIF). VIF measures the extent to which the variance of the estimated coefficients is inflated due to collinearity among independent variables in the regression. Appendix 3 presents the VIFs of the estimated coefficient in each of regressions of probit regression (probability of FCTs being acquired) on the determinants of FCTs being acquired. The average VIF for the probit regression (first-stage) is 1.6, and the VIFs for individual variable range from 1.01 to 3.21, and the

tolerance values range from 0.31 to 0.99. Moreover, the variance inflation factors (VIF) for selected independent variables that are reported in Appendix 3 are very low, suggesting that no multicollinearity problems. All of the VIFs are below 5 so that multicollinearity does not appear to be an issue. Multicollinearity is low when the variance inflation factors (VIFs) are below a rule-of-thumb threshold value of 10 and the tolerances larger than 0.1 (see for example Kennedy 1992, and Chatterjee and Hadi 2012). Therefore, we do not find any evidence of multicollinearity in our sample.

Results from applying our probit model from the first-stage of the HSM to the sample are presented in Table 2.5. We conduct the Heckman 2-stage regression to treat for the presence of endogeneity in our specification models. The calculation of an Inverse Mills ratio (IMR) can mitigate the endogeneity issue. In the first stage of HSM, we estimate the likelihood of *FCTs* being acquired over healthy targets. The coefficients of *ICR* are negative and significant at the 1% level for most of the models. This implies that the higher the interest coverage of the bidder the lower the possibility of the acquirer acquiring FCTs.

This could suggest that acquirers with a stable financial condition are more prone to acquire healthy firms. The coefficient of *SIZE* and *SIZETARGET* are positive and significant at the 1% level for all models. This implies that the bigger firms have more tendency of acquiring financially constrained targets. Smaller targets are preferable to be acquired if the target is considered as a financially constrained target. The coefficients of *Aca* are positive and significant at the 5% and 1% levels.

Acquirers that acquire FCTs are more likely to acquire only certain assets of the target only. One surprising result is the coefficient of *ALLCASH*. Our result shows the coefficient of *ALLCASH* is significantly negative. This suggests that acquirers who acquire financially constrained targets have a tendency of paying with less than 100% cash for the M&A transaction. The coefficients for both *TECHTARGET* and *TECHBIDDER* are significantly positive for all the models. In terms of an economics interpretation of these two coefficients, this suggests that when it comes to M&A involving financially constrained targets, acquirers that are operating their business in high technology industries are more likely to acquire financially constrained targets. Targets that are in high technology industries are more likely to be chosen in the case of M&A involving

FCTs. We have chosen to apply the HSM in our study to serve the research objectives simultaneously. The first result of our first research question has been presented above. In the next section, we present the results from the second stage of the HSM.

Table 2.5: Results from Heckman Selection Model of Multiple Regression of Cumulative Abnormal Returns (CARs) of Bidder* (Panel A)

Panel A – CAR (-2,0)						
Variables		CAR (-2,0)				
		Q1 and Q4			Q1 and Q3, Q4	
	Selection	Model 1	Model 2	Selection	Model 1	Model 2
FCT		0.026*			0.020	
PREMIUM		0.000			0.000	
FCT*PREMIUM			0.000			0.000
DEBTRATIO	-0.006	0.000	0.000	-0.006	0.000	0.000
ICR	-0.001***	0.000	0.000	0.000	0.000	0.000
SIZE	0.059***	-0.003***	-0.003***	0.067***	-0.003***	-0.003***
RELATED	0.112	-0.005	-0.009	0.054	-0.002	-0.003
CRISIS	-0.022	-0.013	-0.010	0.111	-0.011	-0.008
SOX	0.318	0.014	0.010	-0.159	0.018**	0.007
ALLCASH	-0.326***	0.014***	0.013***	-0.188***	0.011***	0.013***
FRIENDLY	0.120	-0.009	-0.004	-0.015	-0.009*	-0.010**
AACOUNT	-0.042	0.006**	0.007**	-0.040	0.005**	0.005**
SIZETARGET	-0.110***	0.000	0.000	-0.068***	-0.001	-0.001
ACA	0.259**	0.000	0.006	0.208**	0.002	0.002
TENDEROFFER	-0.021	0.004	0.000	-0.008	0.000	0.001
ROEBIDDER		0.000	0.000		0.000	0.000
TECHBUBBLE		-0.004	0.007		-0.014	0.016**
MULTIPLEBID	0.406***			0.327**		
MAACTIVITY	-0.483			0.276		
TACOUNT	0.130*			0.120*		
COMPLETION	0.000			0.000		
TECHTARGET	0.416***			0.380***		
TECHBIDDER	0.446***			0.433***		
IMR		-0.011	-0.007*		-0.006	-0.012*
Constant	4.591	0.002	0.018	0.012	-3.964	0.035***
Observations	1654	1654	1654	2568	2568	2568
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Chi- squared	234.120	175.340		207.920	175.940	
Pseudo R-squared	0.102			0.066		
Adj R-squared			0.045			0.042

* [*** p<0.01, ** p<0.05, * p<0.1]

Source: Compiled by author from data obtained from COMPUSTAT, Thomson One Banker, CRSP, and statista.com

2.4.2 Multivariate analysis

We now examine the effects of financial constraints in target firms on cumulative abnormal returns, buy-and-hold returns, operating performance, and discounts. The advantage of the multivariate analysis is that it allows us to draw a *ceteris paribus* conclusion, which a simple t-test of means or Wilcoxon-test of medians cannot do

(Khatami *et al.*, 2015). The results from the multivariate regression of the second stage HSM are presented in Table 2.6, 2.7, 2.8, and 2.9.

We provide a Pearson correlation matrix among the independent variables in our multiple regression (please refer to Appendix 4 on page 210). The results indicate all the independent variables and the control variables are low and moderately correlated, between -0.05 and 0.69 which confirms multicollinearity is not a problem. We are therefore confident that the variables provide sufficient independent information and that multicollinearity is not an issue (Cohen and Cohen, 1983). We also compute variance inflation factors (VIF). Appendix 5 presents the VIFs of the estimated coefficient in each of multiple regressions (dependent variables) on the firm's characteristics. The average VIF for the multiple regression (second-stage) is 1.86, and the VIFs for individual variable range from 1.01 to 5.03, and the tolerance values range from 0.19 to 0.99. All of the VIFs are below 10 so that multicollinearity does not appear to be an issue. Multicollinearity is low when the variance inflation factors (VIFs) are below a rule-of-thumb threshold value of 10 and the tolerances larger than 0.1 (see for example Kennedy 1992, and Chatterjee and Hadi 2012). Therefore, we do not find any evidence of multicollinearity in our sample.

In the second stage, we compute the Inverse Mills Ratio (IMR) and include it as an explanatory variable in each of the *CARs, BHRs, ROAs,* and *DISCOUNT/PREMIUM* regressions. The *IMR* is insignificant for *CARs* regression and one of the Discount/Premium regressions. Thus, our findings do not suffer from self-selection bias (see e.g., Table 2.6).

However, the remaining *IMR* are significant in the *BHRs, ROA* and Model 1 of the Discount/Premium regressions. This suggests that the results should be interpreted cautiously. The likelihood ratio test of the correlation between the two error terms of the selection (first stage) and outcome equations (second stage) provides a strongly significant result. This indicates that unobservable firm characteristics and deal characteristics determining the decision to acquire financial constraint targets also influence the performance and the discount/premium in the deal.

Table 2.6: Results from Heckman Selection Model of Multiple Regression of Cumulative Abnormal Returns (CARs) of Bidder* (Panel B)

Panel B – CAR (-3,0)						
Variables	CAR (-3,0)					
		Q1 and Q4			Q1 and Q3, Q4	
	Selection	Model 1	Model 2	Selection	Model 1	Model 2
FCT		0.040**			0.0318**	
PREMIUM		0.000			0.000	
FCT*PREMIUM			0.000			0.000
DEBTRATIO	-0.006	0.0004*	0.000	-0.006	0.000	0.000
ICR	-0.001***	0.000	0.000	0.000	0.000	0.000
SIZE	0.0592***	-0.003**	-0.003***	0.067***	-0.004***	-0.004***
RELATED	0.112	-0.014***	-0.015***	0.054	-0.011**	-0.012***
CRISIS	-0.022	-0.009	-0.010	0.111	-0.012	-0.010
SOX	0.318	0.014	0.004	-0.159	0.020**	0.005
ALLCASH	-0.326***	0.012**	0.012**	-0.188***	0.011***	0.012***
FRIENDLY	0.120	-0.004	-0.003	-0.015	-0.005	-0.007
AACOUNT	-0.042	0.003	0.002	-0.040	0.003	0.004
SIZETARGET	-0.110***	0.000	0.000	-0.068***	-0.001	0.000
ACA	0.259**	0.011	0.011*	0.208**	0.009*	0.008
TENDEROFFER	-0.021	0.004	0.005	-0.008	-0.001	0.000
ROEBIDDER		0.000	0.001		0.000	0.001
TECHBUBBLE		-0.011	-0.004		-0.017	0.013
MULTIPLEBID	0.406***			0.327**		
MAACTIVITY	-0.483			0.276		
TACOUNT	0.130*			0.120*		
COMPLETION	0.000			0.000		
TECHTARGET	0.416***			0.380***		
TECHBIDDER	0.446***			0.433***		
IMR		-0.016	-0.022**		-0.011	-0.019**
Constant	4.591	0.000	0.038***	-3.964	0.011	0.046***
Observations	1654	1654	1654	2568	2568	2568
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Chi- squared	234.120	161.490		207.920	167.320	
Pseudo R-squared	0.102			0.066		
Adj R-squared			0.014			0.025

* [*** p<0.01, ** p<0.05, * p<0.1]

Source: Compiled by author from data obtained from COMPUSTAT, Thomson One Banker, CRSP, and statista.com

Columns 2 and 3 of Table 2.6 show the results of CARs of bidders with the financially constrained targets together with all control variables used. We use the same three-day and four-day event window of (-2, 0) and (-3, 0) of *CARs* of bidders. Column 3 of Table 2.6 represents the *CARs* of two groups of targets, namely financial constraint targets and healthy targets. We classify between those targets that fall in both extreme quartiles of the KZ-Index. Column 5 of Table 2.6 represents the multivariate regression of *CARs* of acquirers between the first quartile, and the third and fourth quartiles. The first quartile is the extreme healthy targets, and the third and fourth quartiles are M&A involving firms that are considered as financial constraint targets. The application of the

classification is the same for the remaining columns as for Model 1, where we compare the most extreme quartiles, and Model 2 is where we test the FCT and premium variables as an interaction variable.

Our H1a states that bidders that acquire bankrupt/FCT have a positive market reaction surrounding the announcement day. This is consistent with the costly signalling theory that suggests that if the cost of the signal is higher for the bad type than it is for the good type, then it is hard for other firms to copy, and so the signal can be regarded as being credible. We posit that when bidders make an announcement to acquire bankrupt or financially constrained targets, the cumulative abnormal return (CAR) surrounding the announcement could be positive. This creates the perception that the bidder is stable and willing to take the risk of acquiring problematic targets.

When we examined the effect of *CARs* between the bidders that acquired FCTs and healthy targets (Model 1), the coefficient of our main variable, FCT, is positive and significant at the 1% level. Statistically, the coefficient in Model 1 of both panel A and B of Table 2.6 show positive and significant coefficients for FCT that fall into the two extreme groups of first and the fourth quartiles. The results are consistent for four-day event window CARs (-3, 0). However, we only find positive and significant coefficient at 5 percent significant level for the FCT that fall under first quartile and the third and fourth quartiles. Economically, this implies that bidders that acquire FCTs earn more *CARs* compared with bidders that acquire healthy targets. Even though it is indirectly costly for bidder in terms of future uncertainty, but it will benefit the bidder indirectly by establishing a more positive reputation for them. Practically, this could result in a positive wealth creation to bidders surrounding the announcement date; as such announcements are positive signals to competitors and investors.

Other control variables also show significant results. The results show that the coefficient of *SIZE* is negatively significant at the 1% level. This implies that the bigger the size of the bidder, the lower the CARs surrounding the day of the announcement. If we compare the results from the probit regression, we can see that big acquirers have a greater tendency of acquiring FCTs. However, the results from the regression of *CARs* show that big acquirers do not earn more *CARs* compared with small acquirers. The coefficient of *SOX* is positive and significant at the 10% and 1% levels for Model 1 and

Model 2 respectively. This suggests that the acquisitions involving financial constraint targets after the introduction of *SOX* yield more *CARs* for acquirers. Transactions involving only cash for the transaction yield more CARs for the acquirers. This can be seen from the positive and significant coefficient of the *ALLCASH* variable at the 1% level. The coefficient of *ACCOUNT* is positive and significant at the 10% and 5% levels. This indicates that the higher the number the acquirer advisors, the more *CARs* that they earn. The coefficient of *TECHBUBBLE* is only significant at the 10% level for Model 2 of CARs.

Our H1b states that bidders that acquire FCT have lower buy-and-hold returns compared with bidders that acquire healthy firms. To prove the hypothesis, we conduct a HSM with BHRs of bidders for the event window (+1, +36). Columns 3, 4, 6 and 7 of Table 2.7 presents the BHRs of bidders for the event window (+1, +36). The interesting results here are that the BHRs of acquirers are negative and significant at the 5% and 1% level for Models 1 of both types of samples (i.e., 1) Q1 and Q4 and 2) Q1 and Q3, Q4). This implies that acquirers who acquired financial constraint targets earn less BHRs than those who acquired healthy targets. The coefficient of our main variable, FCT, shows negative and significant results with BHRs of bidders. This suggests that the positive figure and significance of the t-test and Wilcoxon test that we have conducted can be explained by other factors, but not the financial health of the targets. These factors include the period or year of the announcement made and the friendly type of M&A among the factors that affect the level of BHRs of the bidders. Theoretically, M&A involving bankrupt targets or FCT gives an avenue to the bidder to identify any possible signs, and may give them more time to have in-depth and due diligence in analysing the true future value of a firm (Howson, 2003). Once the bidder really understands the reason a firm is financially constrained, then it is more realistic for the bidder to structure the best profitability improvement plan for both the bidder and target. If bidders experience positive abnormal returns around the announcement periods, it will also posit to be positive in the long run if the decision to acquire the targets is projected to be the most profitable investment. If the top management only acquire so as to create a reputation, then it will be shown that the bidders will not be able to create wealth in the long-term. Our finding supports the Rent-Seeking Hypothesis, where the *BHRs* of

bidders are negative and significant at the 5% and 1% level. This theory explains that Rent-Seeking behaviour is the attempt of individuals or groups to increase their welfare while making a negative contribution to net society welfare: focussing on short-term goals leading executives to take excessive risks or involve in non-value-added activities. Bidders of FCT fail to create wealth in the long-term due to management behaviour and it could be just a 'game' that top management play for the sake of rent-seeking behaviour and to make their profiles active.

Table 2.7: Results from Heckman Selection Model of Multiple Regression of Buy-and-Hold Returns (BHRs) of Bidder*

Variables	**BHRs (+1,+36)**					
		Q1 and Q4			Q1 and Q3, Q4	
	Selection	Model 1	Model 2	Selection	Model 1	Model 2
FCT		-0.833**			-0.796***	
PREMIUM		0.000			0.000	
FCT*PREMIUM			0.001			0.000
DEBTRATIO	-0.006	-0.016***	-0.015***	-0.006	-0.013***	-0.013***
ICR	-0.001***	0.000	0.000	0.000	0.000	0.000
SIZE	0.059***	0.038	0.036	0.067***	0.035*	0.032
RELATED	0.112	0.244**	0.242**	0.054	0.191**	0.204**
CRISIS	-0.022	0.521	0.721*	0.111	0.748***	0.797***
SOX	0.318	-0.595**	-0.644**	-0.159	-0.623***	-0.569***
ALLCASH	-0.326***	-0.232**	-0.194*	-0.188***	-0.153*	-0.157*
FRIENDLY	0.120	-0.365**	-0.376***	-0.015	-0.248**	-0.226**
AACOUNT	-0.042	-0.057	-0.055	-0.040	-0.021	-0.021
SIZETARGET	-0.110***	-0.100***	-0.096***	-0.068***	-0.089***	-0.092***
ACA	0.259**	-0.126	-0.140	0.208**	0.054	0.045
TENDEROFFER	-0.021	0.092	0.066	-0.008	-0.029	-0.051
ROEBIDDER		0.020	0.019		0.013	0.012
TECHBUBBLE		0.586*	0.261		0.645***	-0.044
MULITPLEBID	0.406***			0.327**		
MAACTIVITY	-0.483			0.276		
TACOUNT	0.130*			0.120*		
COMPLETION	0.000			0.000		
TECHTARGET	0.416***			0.380***		
TECHBIDDER	0.446***			0.433***		
IMR		0.465**	0.360*		0.443**	0.294*
Constant	4.591	1.430***	0.714***	-3.964	1.341***	0.589***
Observations	1654	1654	1654	2,568	2,568	2,568
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Chi- squared	190.090	234.120		181.410	207.920	
Pseudo R-squared	0.102			0.066		
Adj R-squared			0.053			0.044

* [*** p<0.01, ** p<0.05, * p<0.1]

Source: Compiled by author from data obtained from COMPUSTAT, Thomson One Banker, CRSP, and statista.com

Other independent variables used in this study show significant results in BHRs regression. We find that the coefficient of the financial crisis variable is positive and

significant at the 10% and 1% levels for Models 1 and 2 respectively. This means that bidders that merged or acquired targets during the financial crisis earned more BHRs compared with bidders that acquired targets during other periods. This might be due to the lower bargaining power of targets during the financial crisis. The coefficient of the tech bubble is positive and significant at the 1% level. The coefficient of *SOX* is negative and significant at the 1% level. This implies that that M&A after the introduction of the Sarbanes-Oxley Act 2002 yield lower *BHRs* to bidders. The coefficient of *Friendly* is negative and significant at the 1% level. We extend our analysis on the *ROAs* of the bidders to examine the long-term effect of M&A involving FCTs.

The coefficients for the control variable that are significant are almost the same when we run with the median adjusted *ROA* for three years' post-acquisition. From the t-test and Wilcoxon test results, we use the Heckman Two-Stage procedure to see the factors that could explain the significant differences in univariate analysis in more detail. As most of the t-tests did not give us any significant differences for the groups that we want to analyse, we decided to winsorize the *ROAs* of bidders to exclude any outliers in the sample. This is because most of the Wilcoxon tests show significant difference, especially for the industry mean and median adjusted *ROAs*. We present the three years post-M&A announcement bidders' medians industry-adjusted *ROA* in Column 6 and 7 of Table 2.8. As we can see, the FC variable shows negative and significant results. The coefficient of FC is negative and significant at the 1% level on the *ROA* for both groups and models that we present in the table. However, the coefficient of lambda or the Inverse Mills Ratios is positive and significant at the 1% level. This implies that there is sample selection bias. The difference in the univariate test cannot be explained by all the variables that we have in our models.

The results for the *ROAs* are also consistent with the findings that we have with the *BHRs* of bidders. We find a negative and significant co-efficient for the event window (+1, +36). The results reflect the theories that we put forward in this study; that this finding supports the rent-seeking theory where management takes the decision to merge and acquire financially constrained targets for short-term purposes. This is so as the announcement of the M&A involving financially constrained targets creates short-term wealth creation for the bidders, but not necessarily in the long-term. This support

our third hypothesis H1c that states that bidders that acquire FCT have lower operating performance compared with bidders that acquire healthy targets.

Table 2.8: Results from Heckman Selection Model of Multiple Regression of Median Industry Adjusted ROA of Bidder*

Variables	Medians Industry-Adjusted ROA					
		Q1 and Q4			Q1 and Q3, Q4	
	Selection	Model 1	Model 2	Selection	Model 1	Model 2
FCT		-0.092***			-0.085***	
PREMIUM		0.000			0.000	
FCT*PREMIUM			0.000			0.000
DEBTRATIO	-0.008**	-0.000*	0.000	-0.010***	-0.000*	0.000
ICR	-0.000***	0.000*	0.000***	0.000	0.000	0.000
SIZE	0.064***	0.026***	0.026***	0.074***	0.025***	0.024***
RELATED	0.104**	0.023***	0.019***	0.030	0.026***	0.026***
CRISIS	-0.131	0.050	0.019	0.075	0.050**	-0.022
SOX	0.518*	-0.056***	-0.018	0.051	-0.060***	0.014
ALLCASH	-0.307***	0.018**	0.030***	-0.192***	0.020***	0.023***
FRIENDLY	0.172**	-0.034***	-0.043***	0.013	-0.028***	-0.029***
AACOUNT	-0.041	-0.016***	-0.015***	-0.044	-0.012***	-0.011***
SIZETARGET	-0.118***	-0.008***	-0.004**	-0.078***	-0.009***	-0.008***
ACA	0.247***	-0.002	-0.010	0.195***	-0.003	-0.005
TENDEROFFER	-0.065	0.015*	0.015*	-0.048	0.003	0.002
ROEBIDDER		0.008***	0.007***		0.005***	0.005***
TECHBUBBLE		0.094***	-0.019		0.077***	-0.015
MULITPLEBID	0.375***			0.322***		
MAACTIVITY	-0.809			0.085		
TACOUNT	0.089*			0.085**		
COMPLETION	0.000			-0.000*		
TECHTARGET	0.337***			0.329***		
TECHBIDDER	0.530***			0.501***		
IMR		0.047***	0.000		0.039***	0.028***
Constant	8.450	-0.062***	-0.120***	-1.762	-0.043**	-0.117***
Observations	4,338	4,338	4,338	6,738	6,738	6,738
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000	0.000
Chi- squared	873.880	641.990		924.740	584.030	
Pseudo R-squared	0.107			0.070		
Adj R-squared			0.122			0.100

* [*** p<0.01, ** p<0.05, * p<0.1]

* Median Industry Adjusted ROA have been winsorized.

Source: Compiled by author from data obtained from COMPUSTAT, Thomson One Banker, CRSP, and statista.com

Columns 8 and 9 of Table 2.9 present the analysis of the regression on discount/premium in the deal value. We choose the percentage of the deal value divided by the market value of the target four weeks before the announcement. The application of the Heckman Two-Stage procedure is applied using the same procedure with our other dependent variables. The coefficient of FC is negative and significant at the 10% level for the first group, and at the 5% level for the second group. The first group of

M&A, where we compare the extreme healthy targets and the extreme FCTs, shows that bidders that acquire financially constrained targets pay the percentage of the deal value divided by the market value of the targets lower by 34.036%, compared with bidders that acquire healthy targets. This is consistent with our hypothesis that M&A involving FCTs are normally paying at discount to FCTs. There is a *fire-sales* transaction when it comes to the M&A involving FCTs. We also present the results for the M&A involving bankrupt targets as a comparison with the M&A involving financially constrained targets. The next section gives the results for the robustness test. We put forward the comparison of the M&A involving bankrupt targets as the robustness test of our results.

Table 2.9: Results from Heckman Selection Model of Multiple Regression of Discount/ Premium in Deal*

Variables	**DISCOUNT/ PREMIUM**			
	Q1 and Q4		**Q1 and Q3, Q4**	
	Selection	Model 1	Selection	Model 1
FCT		-405.100**		-367.300***
DEBTRATIO	-0.006	-0.738	-0.006	-0.626
ICR	-0.001***	-0.062	-0.000	-0.005
SIZE	0.059***	18.140	0.067***	12.030
RELATED	0.112	36.350	0.054	14.220
CRISIS	-0.022	-29.450	0.111	5.453
SOX	0.318	-34.960	-0.159	-50.420
AALLCASH	-0.326***	-35.770	-0.188***	-17.310
FRIENDLY	0.12	-5.586	-0.015	-16.700
AACOUNT	-0.042	-24.340	-0.040	-15.120
SIZETARGET	-0.110***	4.381	-0.068***	6.730
ACA	0.259**	9.984	0.208**	1.391
TENDEROFFER	-0.021	0.605	-0.008	2.549
RROEBIDDER		1.740		0.821
TECHBUBBLE		51.440		43.51
MULTIPLEBID	0.406***		0.327**	
MAACTIVITY	-0.483		0.276	
TACOUNT	0.130*		0.120*	
COMPLETION	-0.000		-0.000	
TECHTARGET	0.416***		0.380***	
TECHBIDDER	0.446***		0.433***	
IMR		232.300*		199.200**
Constant	4.591	72.660	-3.964	156.900
Observations	1,654	1,654	2,568	2,568
Year Dummies	Yes	Yes	Yes	Yes
Prob > Chi-squared	0.000	0.000	0.000	0.000
Chi- squared	234.120	123.780	207.920	90.550
Pseudo R-squared	0.102		0.066	

* [*** p<0.01, ** p<0.05, * p<0.1]

Source: Compiled by author from data obtained from COMPUSTAT, Thomson One Banker, CRSP, and statista.com

2.4.2.1 Wealth effect comparison between the bidders that acquired FCTs versus bankrupt targets

We present the results of *CARs* of bidders that acquired bankrupt targets in Table 2.10. The second and the third columns of Table 2.10 present the results for regression on *CARs* of bidders. We chose the same event window (-2, 0) as the financial constraint data set. The results are consistent with the financially constrained datasets. The coefficient of bankruptcy is positive and significant at the 10% level on *CARs* of the bidders. This result is not only consistent with the coefficient of FC on *CARs*, but is also consistent with the past findings by Jory and Madura (2009) and Hotchkiss and Mooradian (1998).

Table 2.10: Heckman Two-Stage Procedure- CARs and BHARs*

Variables	CAR (-2,0)		CAR(-3,0)		BHAR(+1,+12)		BHAR(+1,+36)	
	Selection	Model 1	Selection	Model 2	Selection	Model 1	Selection	Model 2
BANKRUPTCY		0.059*		0.072*		-0.299		0.381
SIZE		-0.006**		-0.006*		-0.084**		0.002
TOBIN'S Q		-0.005***		-0.005***		-0.073***		-0.089***
MULTIPLEBID		-0.002		-0.009		0.159		0.204
ACA	-1.045***	0.014	-1.045***	0.017	-1.054***	-0.171	-1.037***	0.091
RELATED	0.252***	-0.004	0.252***	-0.002	0.190**	-0.048	0.207**	-0.064
FRIENDLY	0.840***	-0.018	0.840***	-0.023	0.806***	0.030	0.814***	-0.116
ALLCASH		0.009		0.007		-0.009		0.076
TARGET-ADVISOR		-0.007		-0.005		-0.144*		-0.053
CRISIS		-0.001		0.002		0.077		0.219
TECHBUBBLE		0.003		0.002		0.173**		0.247**
AACOUNT	-0.255***		-0.255***		-0.243**		-0.242**	
TACOUNT	-0.047		-0.047		-0.046		-0.046	
COMPLETION	0.001***		0.001***		0.001***		0.001***	
IMR		-0.034		-0.045*		0.156		-0.296
Constant	-0.854***	0.030	-0.854***	0.034	-0.812***	0.540*	-0.828***	0.222
Observations	703	703	766	766	784	784	784	784
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chi- squared	92.930	85.710	92.930	82.360	91.000	86.520	89.340	79.680
Pseudo R-squared	0.088		0.088		0.084		0.082	

* [*** p<0.01, ** p<0.05, * p<0.1]

Source: Compiled by author from data obtained from COMPUSTAT, Thomson One Banker, CRSP, and statista.com

Columns 4 and 5 of Table 2.10 show the Heckman Two-Stage procedure results on *BHARs* of bidders of bankrupt targets. We chose the same event window of (+1, +12) to analyse in more detail. The coefficient of the bankruptcy variable is negative, but not

significant. This finding is consistent with the finding with the *BHRs* of bidders that acquired financially constrained targets.

We present the results of regression on *ROAs* of bidders that acquired bankrupt targets in Table 2.11. We break down the analysis into three: (1) the *ROAs* industry mean adjusted one year after the year of announcement; (2) *ROA* of year two after the year of announcement industry mean adjusted; and (3) the two-year *ROAs* industry mean-adjusted.

Table 2.11: Heckman Two-Stage Procedure- Operating Performance of bidders that acquired bankrupt targets*

	M&A Involving bankrupt targets ROAs one year after M&A		M&A Involving bankrupt targets ROAs two years after M&A		M&A Involving bankrupt targets ROAs three years after M&A	
BANKRUPTCY		0.034		-0.002		-0.015
SIZE		0.027***		0.029***		0.051***
TOBIN'S Q		0.003		0.007*		0.020***
BIDCOUNT		0.040		-0.013		-0.018
ACA	-1.040***	0.022	-1.082***	-0.011	-1.150***	0.029
RELATED	0.222**	-0.012	0.220**	0.001	0.209**	0.009
FRIENDLY	0.934***	-0.029	0.895***	-0.059	0.846***	-0.007
ALLCASH		0.018		-0.006		-0.005
TARGETADVISOR		-0.024		-0.013		-0.009
CRISIS		0.005		0.004		0.028
TECHBUBBLE		-0.010		-0.020		-0.024
AACOUNT	-0.231**		-0.225**		-0.258***	
TACOUNT	-0.047		-0.043		-0.035	
COMPLETION	0.001***		0.001***		0.001***	
IMR		-0.035		-0.005		0.014
Constant	-0.935***	-0.104	-0.906***	-0.014	-0.841***	-0.152**
Observations	775	775	769	769	749	749
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000	0.000
Chi- squared	96.140	82.800	96.110	86.500	96.790	
Pseudo R-squared	0.090		0.090		0.093	

*[*** p<0.01, ** p<0.05, * p<0.1]

Source: Compiled by author from data obtained from COMPUSTAT, Thomson One Banker, CRSP, and statista.com

We chose to present *ROA* into these three groups, as the results from the t-test and Wilcoxon test only show a significant coefficient for the *ROAs* industry mean adjusted figures for the first and the second year after the year of the announcement. To be consistent with the findings of the *ROAs* of the bidders that acquire financially constrained targets, we use panel data analysis to analyse the differences in the univariate test that we have conducted with the *ROAs* variables of bidders that acquired

financially constrained targets. Since the two-year figures are significant, we run the panel analysis for the *ROAs* industry mean adjusted of bidders that acquired bankrupt targets. The coefficient of the bankruptcy variable is not significant on *ROAs,* whether we use yearly industry mean adjusted *ROAs,* or panel analysis for the two consecutive years of ROAs of the bidders that acquired bankrupt targets.

2.5 Conclusions

Using two datasets of M&A involving 1) financial constraint targets, and 2) bankrupt targets gives us a certain consistency in our results. We analyse the post-acquisition wealth creation of bidders using *CARs, BHRs, and ROA,* as well as analyse of M&A premium when M&A involve financial constraint targets. The main contribution of this study is the analysis of the financial health of targets using the KZ-index, and the comparison of the findings with the bankrupt targets. We analyse two set of samples: 1) FCTs vs. HTs, and 2) bankrupt targets vs. non-bankrupt targets.

We find that the *CARs* for the three-day event window of (-2,0) for acquirers that acquired financial constraint or bankrupt targets is more compared with those acquirers that acquired healthy targets. Our finding is consistent with our H1a. Our H1a states that bidders that acquire bankrupt/FCT have a positive market reaction surrounding the announcement day. This is consistent with the costly signalling theory that suggests that if the cost of the signal is higher for the bad type than it is for the good type, then it is hard for other firms to copy, and so the signal can be regarded as being credible. We posit that when bidders make an announcement to acquire bankrupt or financially constrained targets, the cumulative abnormal return (CAR) surrounding the announcement could be positive. This creates the perception that the bidder is stable and willing to take the risk of acquiring problematic targets.

Our findings on BHRs and ROA also consistent with our H1b on BHRs and H1c on ROAs. Our H1b states that bidders that acquire FCT have lower buy-and-hold returns compared with bidders that acquire healthy firms. Our H1c states that bidders that acquire FCT have lower operating performance compared with bidders that acquire healthy targets. The coefficient of FCT on BHRs regression is negative and significant. This implies that acquirers who acquired financial constraint targets earn less BHRs than

those who acquired healthy targets. We find a negative and significant co-efficient for the event window (+1, +36). The results reflect the theories that we put forward in this study; that this finding supports the rent-seeking theory where management takes the decision to merge and acquire financially constrained targets for short-term purposes. This is so as the announcement of the M&A involving financially constrained targets creates short-term wealth creation for the bidders, but not necessarily in the long-term. Theoretically, M&A involving bankrupt targets or FCT gives an avenue to the bidder to identify any possible signs, and may give them more time to have in-depth and due diligence in analysing the true future value of a firm (Howson, 2003). Once the bidder really understands the reason a firm is financially constrained, then it is more realistic for the bidder to structure the best profitability improvement plan for both the bidder and target. If bidders experience positive abnormal returns around the announcement periods, it will also posit to be positive in the long run if the decision to acquire the targets is projected to be the most profitable investment. If the top management only acquire so as to create a reputation, then it will be shown that the bidders will not be able to create wealth in the long-term. Our finding supports the Rent-Seeking Hypothesis, where the BHRs of bidders are negative and significant at the 5% and 1% level. This theory explains that Rent-Seeking behaviour is the attempt of individuals or groups to increase their welfare while making a negative contribution to net society welfare: focussing on short-term goals leading executives to take excessive risks or involve in non-value-added activities. Bidders of FCT fail to create wealth in the long-term due to management behaviour and it could be just a 'game' that top management play for the sake of rent-seeking behaviour and to make their profiles active.

We also find that bidders pay *discounts* to FCTs rather than a *premium.* Our last hypothesis, i.e., H2 states that the M&A premium is inversely related to a target's degree of financial constraints. We choose the percentage of the deal value divided by the market value of the target four weeks before the announcement. The application of the Heckman Two-Stage procedure is applied using the same procedure with our other dependent variables. The coefficient of FCT is negative and significant at the 10% level for the first group (Q1 and Q4), and at the 5% level for the second group (Q1 and Q3, Q$). The first group of M&A, where we compare the extreme healthy targets and the

extreme FCTs, shows that bidders that acquire financially constrained targets pay the percentage of the deal value divided by the market value of the targets lower by 34.036%, compared with bidders that acquire healthy targets. This is consistent with our hypothesis that M&A premium is inversely related to the degree of financial constraints of the target. Valuation premium tend to be inversely related to the degree of information asymmetry between the acquirers and targets (Agrawal *et al.*, 2016). This will be so in a situation where market participants are liquidity-constrained (Dow and Han, 2016) as well as if the target industry is financially constrained (Oh, 2014). This is because of the due diligence processes or steps taken by bidders prior to the M&A. There is no issue of overpayment to targets. This can be improved when an acquisition target is a financially constrained firm.

To our knowledge this paper is the first paper that makes a comparison between the two types of financial conditions of targets, i.e., financial constraints (using KZ-Index) and bankrupt targets, in one study. Our study examines the factors that contribute to the choice of the bidders to acquire FCT and bankrupt targets, by applying the HSM. The findings of this study are contrary to the previous finding by Khatami *et al.* (2015). They claim that financial constraints of target companies significantly increase acquisition premiums for targets, but in our analysis, we find that financially constrained targets are acquired at discounts.

From a practical perspective, our results highlight the usefulness of acquisition strategy focused on the acquisition of financial constraint targets. While we have seen there are potential benefits that derive from acquiring healthy targets, our results suggest that acquirers may benefit more from acquiring financial constraint targets in the short-run rather than in the long-run. Devising this kind of acquisition strategy could be useful especially for bidders that have the intention to improve their stock performance in the short-term. Our results also provide a practical implication for investors in making decisions. Our results show that the bidders' cumulative abnormal return (CAR) surrounding the announcement could be positive for bidders that acquired financial constraint targets. This creates the perception that the bidder is stable and

willing to take the risk of acquiring problematic targets. Investors must be more cautious in investing in those firms as we find adverse performance results in the long run.

Chapter 3

Accrual-based EM and Real EM Activities Around Corporate Reorganization and Restructuring

3.1 Introduction

It is widely known that earnings are the single most important figures of financial information (Dichev *et al.,* 2016). The need for quality of earnings continues to garner a lot of public attention; furthermore, the efficiency of the stock market is a direct consequence of the quality of the accounting information published. This paper considers the effects of earnings management (hereafter EM) by firms engaged in corporate restructuring and reorganization, namely through carve-outs, sell-offs, spin-offs, and other divestitures. We examine US parent targets of a total of 10,495 firms involved in restructuring through carve-outs, sell-offs, spin-offs, and divestitures in the US from 1985 to 2012. We analyse both types of EM that are considered in this paper, i.e., accruals-based earnings management (AM) and real activities manipulations (RM). The main objective of this study is to examine the existence of the EM activities in the year prior to restructuring by parent targets. We also analyse the EM activities and impact of managers' engagement in EM activities on firms' performance and stock volatility. We extend our study by examining the factors that contribute to the choice of RM over AM.

Prior research has documented that restructuring is associated with EM activities and subsequent declines in firm operating performance (e.g., Rangan, 1998; Teoh *et al.*, 1998a; Eddey and Taylor, 1999; Shivakumar, 2000; Balatbat and Lim, 2003;Cohen and Zarowin, 2010; Kothari *et al.*, 2016). Several studies examine the association between AM by firms that engage in seasoned equity offerings (SEO) and its effects on the firm's operating performance (see e.g., (Rangan, 1998; Teoh *et al.*, 1998a; Teoh *et al.*, 1998b). Cohen and Zarowin (2010) and Kothari *et al.*, (2016) examine the effect of both elements of EM, i.e., accrual-based and real earnings manipulation activities on operating

performance of firms that involved in SEO. Past literatures have documented the association between the EM activities by firms that engage in Initial Public Offerings (IPO) and the subsequence effects on firms 'performance (see e.g., (Chen *et al.*, 2013; Gao *et al.*, 2017; Gounopoulos and Pham, 2017; Lo *et al.,* 2017). However, studies on specific types of restructuring such as carve-out, spin-off, sell-off, and divestitures are limited.

Carve-outs are a specialized form of IPO where the parent firm typically retains a controlling portion of equity in the unit (Madura and Nixon, 2002). The only study by Balatbat and Lim (2003) on carve-outs has only analysed accrual-based EM activity. However, we refer to several studies on IPO for comparison (see e.g., (Chen *et al.*, 2013; Gao *et al.*, 2017; Gounopoulos and Pham, 2017; Lo *et al.*, 2017). There is a need to analyse both types of EM activities by firms that are involved in restructuring. The analysis of both types of EM activities, i.e., AM and RM, provides better understanding of the impact of each type of EM activity on firms' future performance. RM is more severe as it affects cash flows (Cohen and Zarowin, 2010). It is important to examine the EM activities of restructuring firms as the decision to restructure affects firm's future performance. In addition, restructuring is associated with multiple events as carve-outs, sell-offs, spin-offs, and other divestitures, and are also considered as subsequent events to other major events such as M&A, IPO and SEO (see e.g., Otsubo, 2009).

The need to analyse the elements of RM activities in the year prior of restructuring is important because any restructuring announcements are important events. In addition, the introduction of SFAS 146 made it significantly more difficult for managers involved in sell-offs to manipulate firms' accounting figures using accrual-based EM activities. Thus, managers of restructuring firms might switch to real EM activities instead of accrual-based EM, and thus make it more difficult for auditors to trace any aggressive EM activities by the firm. SFAS 146 Accounting for Costs Associated with Exit or Disposal Activities (SFAS 146) was issued by the Financial Accounting Standards Boards (FASB) in June of 2002. SFAS 146 requires companies to recognize costs associated with exit or disposal activities at the time they are incurred and not as a liability at the date of a commitment to a restructuring plan.

The existence of EM activities among restructuring firms M&A[4], initial public offerings[5] (IPO), seasonal equity offerings[6] (SEO) and carve-outs, consequently affect the firm's operating performance; the introduction of SFAS 146 raised several research questions. Do parent targets engage in earning management activities in the years prior to corporate restructuring in carve-outs, sell-offs, spin-offs, and other divestitures[7]? If so, what is the impact of EM activities on firm performance? Do the firms that have an EM index above the median industry-year EM index have less stock volatility? Finally, what are the factors that could explain the choice of accrual-based versus real earnings management activities among firms that are involved in restructuring? It is important to address these questions in the context of these restructuring firms as they are unique in that they combine characteristics of both restructuring and financial transactions.

Motivated by the scarcity of empirical evidence on the EM activities involving restructuring firms, we address these research questions and revisit the EM activities in carve-out, M&A, IPO, and SEO by examining the relationship between EM activities and firm performance of parent targets that are involved in carve-outs, sell-offs, spin-offs, and divestitures. We investigate both the accrual-based and real EM activities of firms involved in restructuring in the United States (US), in terms of nature (accruals-based earnings management (AM) and real activities manipulations (RM)), direction (income-decreasing or income increasing EM), and consequences on firm performance of targets that are involved in the restructuring. In terms of the nature of EM activities, we analyse both types of EM i.e., accrual-based and real EM activities. We analyse the EM patterns both pre- and post-restructuring. We analyse targets that have both time and motivation to engage in EM activities. We examine EM activity by firms that are involved in reorganization and restructuring, specifically through carve-outs, sell-offs, spin-offs,

[4] See e.g., Eddey and Taylor (1999), Ben-Amar and Missonier-Piera (2008), Anilowski *et al.* (2009), and Anagnostopoulou and Tsekrekos (2015).
[5] See e.g., Lo (2008), Eriksson (2015), Kalgo *et al.*, (2015), and Aktas *et al.*, (2016).
[6] See e.g., Teoh *et al.* (1998), Shivakumar (2000), and Cohen and Zarowin (2010).
[7] We use the term restructuring interchangeably with carve-outs, sell-offs, spin-offs, and other divestitures in this study

and other divestitures. Past literature on carve-out, M&A, IPO and SEO serves as the motivation for our study; this is because they present EM activities in firms engaging in restructuring. Due to the scarce literature in EM (to the best of our knowledge there is only one paper by Balatbat and Lim (2003) related to carve-outs), we refer to SEO, M&A, and IPO literature to form our research framework. This study also investigates the existence of EM by firms that engage in restructuring, and explores the association between EM and the firms' performance and stock volatility. We use various methods of measuring firms' performance, namely the changes in the return on assets (hereafter ROA), cumulative abnormal returns (hereafter CARs), and buy-and-hold abnormal returns (hereafter BHARs). In addition to this, we include the analysis of post-restructuring risk. As explained earlier, the introduction of SFAS 146 has forced managers to trade-off the use of accruals-based earnings management (AM) and real activities manipulations (RM); it has also made it more difficult for auditors to trace the aggressiveness of real EM as managers can always justify the reasons for any transactions. The use of AM manipulation activities has no direct cash flow consequences, but RM activities affect cash flows.

We find solid support for our interpretations. We find that parent targets manage earnings downward by adopting income-decreasing EM activities a year before restructuring, and continue even after restructuring. Our results show that the EM index three years pre- and post-restructuring is negative. Parent targets become involved in restructuring to reorganize their operation and to get external or internal financing. By adopting income-decreasing EM activities a year before the restructuring gives them ample time to engage in EM that normally happens at the end of any accounting period.

As claimed by Anagnostopoulou and Tsekrekos (2015), downward EM negativity affects the probability of firms seeking buyers to close deals within a reasonable amount of time, as is in the case of M&A. They use various measures to analyse accrual-based EM activity. They also examine EM activity two years before any announcements. EM activities are associated with lower operating performance and stock performance.

The effect is economically significant; we estimate that targets of carve-outs that engage aggressively in EM activities are associated with an average 149% reduction in ROA (carve-out), an average 0.43% to 0.62% reduction in targets' CARs (carve-out and

divestitures), an average 3.07% reduction in one-year BHAR after restructuring (carve-out), and an average reduction of 0.43% in post-restructuring risks (carve-out). These findings lead to the conclusion that equity investors seem to penalize parent targets that engage in real earnings manipulations (RM).

Our empirical results show that there is a significantly negative association between RM and subsequent stock returns and operating performance. These figures are very important to investors as they cannot benefit if a firm's assets decrease in value, resulting from possible loss of competitive advantages or retraction in its economic activity or due to EM activities. Additionally, we provide an explanation on the choices of accrual-based versus real EM activities. We find that the decision by targets to manage earnings by real EM versus accrual-based EM is associated with audit tenure, litigation probability, post-SOX, accrual management flexibility (as captured by net operating assets (hereafter NOA)).

We investigate the factors that influence firms' decisions to manage earnings, and, if so, what is the impact of the engagement on the firm performance. We also analyse which method that normally firms use either AM or RM and the factors that contribute to the choice of the preferable method. To address the first issue related to the factors influencing firm's decision, we follow Cohen and Zarowin (2010) to account for the endogenous selection issue by employing the econometrics model of Heckman (1979) model. There is an issue on self-selection bias when we have data generated by individuals or firms making choices of belonging to one group or another (Maddala, 1983). To account for this issue, we estimate a two- stage model using the Heckman (1979) method to control for firms' self-selection to manage reported earnings. Heckman Selection Model (hereafter HSM) requires the estimation of a selection model that accounts for factor influencing firms' choice to manage earnings. In the first stage, we estimate a selection model to explain firms' overall decisions to engage in earnings management or not. It is important to select variables which are correlated with the choices to manage earnings in the selection model but not directly explain firms' performance in the outcome model.

We also estimate another HSM for the issue related to the choices made by firms either to engage in AM or RM and the factors that contribute to the choice of the

preferable method whether to engage in AM or RM. The process is the same where for the first-stage Heckman Selection Model, we control for the self-selection bias. Next, conditional on this first stage analysis, in the second stage we analyse the factors determining the preference for real earnings management strategies as compared to accruals based ones.

Our study is related to the work of Rangan (1998), Teoh *et al.* (1998a), Balatbat and Lim (2003), Cohen and Zarowin (2010), and Anagnostopoulou and Tsekrekos (2015) who empirically examine the relationship between EM activities and restructuring. We update their works and examine EM activities by targets that engage in restructuring. Our study is related to those studies as some of the EM measures that we use are similar, and the context of the study is also related to restructuring firms. Contrary to studies by Rangan (1998), Teoh *et al.* (1998a), and Balatbat and Lim (2003), their studies focused exclusively on accrual-based (AM) activities while, we examine both types of EM i.e., AM and real earnings (RM) activities. Cohen and Zarowin (2010) for example, use both types of EM activities by seasonal equity offerings (SEO) firms but we extend their work by analysing each type of EM activity separately, and the impact of those activities on firm's performance.

It is important to examine EM activities that engage in restructuring as these types of restructuring are not only involved with external and internal financing, but are also associated with different degrees of subsequent control retained by the parent. Furthermore, carve-outs, sell-offs, spin-offs, and other divestitures are unique in that they combine characteristics of both restructuring and financing transactions. Sell-offs are involved with the SFAS 146, where there is a need for parent targets to recognize the restructuring costs in the year of restructuring that motivates managers to switch to RM activity. We extend the work by Balatbat and Lim (2003) by using a comprehensive sample of public parent targets, as well as examining the real EM activities, and offer new evidence on the choice made by targets between the accruals-based earnings management (AM) and real activities manipulations (RM).

The rest of the Chapter 3 is organized as follows. We review the existing literature and develop our hypotheses in Section 3.2, and present our data and methods in Section

3.3. We present and discuss our findings in Section 3.4, and conclude the paper in Section 3.5.

3.2 Literature Review and Hypotheses Development

3.2.1 Earnings management and motivation of targets to manage earnings: Carve-out, Sell-off, Spin-off and Divestitures

Earnings management (EM) is comprised of various forms of "window-dressing" (SEC (Securities and Exchange Commission), 1999, p. 84) to cover a firm's financial underperformance. There are two types of EM, i.e accrual-based (AM) and real manipulation activities (RM). AM involves the selection of accounting procedures and estimates that conform to generally accepted accounting procedures (GAAP). Past research proposes that non-fraudulent AM that benefits shareholders has been described as less detrimental to existing shareholders and does not impair a firm's cash flows (Kothari *et al.*, 2016; Cohen and Zarowin, 2010; Roychowdhury, 2006). However, aggressive accruals-based earnings management (AM) can be costly because it adversely affects shareholders' trust in managers and, ultimately, shareholders' willingness to invest in a firm (Hewitt *et al.*, 2016).

On the other hand, real activities manipulations (RM) is defined as management actions that deviate from the normal course of business, undertaken with the primary objective of meeting certain earnings targets (Roychowdhury, 2006). RM occurs when managers alter operating activities to achieve a financial reporting objective (e.g., Chan *et al.*, 2015). No clear framework for real operations exists. Due to the increased scrutiny of AM after the passage of the Sarbanes Oxley Act 2002 (SOX), and the introduction of SFAS 146 Accounting for Costs Associated with Exit or Disposal Activities (SFAS 146)[8], a growing empirical research provides evidence that RM has become more common

[8] SFAS 146 Accounting for Costs Associated with Exit or Disposal Activities (SFAS 146) has been issued by the Financial Accounting Standards Board's (FASB) in June of 2002.

among managers (e.g., Bartov and Cohen, 2009; Cohen *et al.*, 2008a; Graham *et al.*, 2005). In addition, the introduction of SFAS 146 made it significantly more difficult for managers to manipulate firms' accounting figures using AM. Thus, managers of restructuring firms might switch to RM activities instead of AM.

Managers engage in income-increasing EM to show an improvement in firms' performance. Income-increasing EM is when managers engage in accrual management, and increase their spending on selling, general and administrative expenses. Income-increasing accruals involve making opportunistic estimates and judgements, such as reducing the allowance for bad debts, reporting fictitious sales, capitalizing expenses, avoiding write-offs, etc. (Nagar and Sen, 2016). Managers can also engage in real activities manipulations (RM) income-increasing by giving excessive sales discounts to increase sales at the end of the year to recognize gains. Firms would engage in income-increasing EM when they are in financial distress (e.g., Nagar and Sen, 2016).

Firms could also use income-increasing EM activities by acquiring firms via mergers and acquisitions (hereafter M&A), where the external financing events could motivate managers to manage earnings, especially in stock-for-stock mergers (e.g., Erickson and Wang, 1999). In addition, in the case of initial public offerings (hereafter IPO) and seasonal equity offerings (hereafter SEO), EM can be used to influence investors at the time of the offering and consequently overvalue the new stock issues (e.g., Cohen and Zarowin, 2010; Rangan, 1998; Teoh et al, 1998a), for IPO to influence the initial offer prices (Balatbat and Lim, 2003).

Managers can also be involved in income-decreasing EM to show firms' underperformance. Firms engage in income-decreasing EM to improve their odds of being acquired (Anagnostopoulou and Tsekrekos, 2015), or to portray a less favourable picture of the firm and therefore to reduce the acquisition price (Ben-Amar and Missonier-Piera, 2008). It could be used to guide analysts' forecasts to improve their firms' chances of meeting or beating that forecast when earnings are announced (Matsumoto, 2002), or to reverse the previous EM transaction (Chen *et al.* 2013; Cohen and Zarowin 2010). Generally, firms manage earnings downwards to avoid a high tax burden (e.g., Eldenburg *et al.*, 2011).

In this study, we seek to add to the literature that states that firms that are involved in restructuring engage in EM activities in the year prior to announcement. Concisely, there is a probability of EM activities' manipulation in firms that are involved in restructuring and reorganization, and it is likely to be associated with meeting certain earnings targets or goals. Past literature on EM activities by restructuring firms shows that firms that are involved in carve-outs engage in AM activities (Balatbat and Lim, 2003). This is insufficient as after the introduction of SOX and SFAS 146, managers are switching to RM activity. There is a need to examine RM involving targets in restructuring.

Restructuring is an event that could be characterized by high information asymmetries. Accounting information is the best element for insiders to deliver the information about the financial condition of firms. However, performance-based compensation, reputation or other self-interested motivations may encourage managers to take advantage of discrepancy in information to inflate earnings and influence stock prices (Fields *et al.*, 2001).

Firms that are in the process of restructuring constitute a setting with motivation to engage in EM activities to achieve their corporate goals (Balatbat and Lim, 2003; Anagnostopoulou and Tsekrekos, 2015; Anilowski *et al.*, 2009). We have highlighted some possible motives for parent targets to engage in EM. First, as pointed out by Anilowski *et al.* (2009) and supported by Anagnostopoulou and Tsekrekos (2015), targets that are seeking buyers could have an incentive to 'window dress' their financial statements to attract buyers. Second, previous studies on firms seeking buyers in M&As, show motivation where targets have economic motives for downward EM; this is so it facilitates the completion of future deals. Studies by Anagnostopoulou and Tsekrekos (2015), Easterwood (1998), Eddey and Taylor (1999), and Ben-Amar and Missonier-Piera (2008) provide evidence of income-decreasing EM (downward EM) by M&A target firms.

Restructuring is a corporate event that is a vital aspect of finance with regard to wealth creation and corporate ownership restructuring. A distinctive element of US corporate activity during the past decade has been the dominance of restructuring that relocates the resources on the core businesses (Slovin *et al.*, 1995). Generally, the

restructuring could refer specifically to a parent firm divesting an operating unit, or it could refer to equity carve-outs, spin-offs, and asset sell-offs. Brigham and Houston (2015, p. 727) explain the four types of divestitures[9] as:

> *"(1) Selling an operating unit to another firm, (2) setting up the business to be divested as a separate corporation and then "spinning it off to the divesting firm's stockholders, (3) following the steps for a spin-off but selling only some of the shares, and (4) liquidating assets outright".*

Slovin *et al.* (1995, p. 90) have described the comparison between carve-outs, sell-offs, and spin-offs as follows:

> *"In an equity carve-out, the parent typically retains a controlling interest in the subsidiary and raises funds through the public sale of unseasoned equity claims on the subsidiary's operations. In a spin-off, the parent transfers its ownership of the subsidiary to existing shareholders without any element of external financing. In an asset sell-off, a parent privately negotiates the sale of a subsidiary to a third party, thereby transferring control of the relevant assets to another firm and raising cash for the parent without any issuance of public securities."*

Different types of restructuring that firms choose have difference intrinsic motives and needs. It is beneficial to examine the relationship between the different types of restructuring with the factors that motivate managers to behave in a certain way. One valuable benefit of a carve-out is that the new subsidiary that has now become a public firm can be used to improve managerial incentive contracts, as has been highlighted by Schipper and Smith (1986) and Holmström and Tirole (1993). Sell-offs, spin-offs and other divestitures are firm restructuring where there is a transfer of the control of resources to acquiring firms. Slovin *et al.* (1995) claim that an asset sell-off is a restructuring mechanism that allows a parent firm to use private transactions. Hite *et al.* (1987) report that announcements of asset sell-offs generate returns for targets.

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[9] We use the terms restructuring and 'carve-outs, sell-offs, spin-offs, and other divestitures' interchangeably in our discussion.

Each type of restructuring involves different features in term of the magnitude and form of external financing involved and the degree of subsequent control retained by a parent over the relevant assets or subsidiaries. These factors can provide greater understanding about parent firms' motives for selecting a specific restructuring method. The differences and various factors that contribute to the choice of the mechanism could also be examined to see the pattern of the EM activities manipulation involving firms that engage in restructuring. Generally, literature on divestitures can be divided into finance literature and strategic literature (see Feldman and McGrath, 2016). The two contradictory focusses on both literature and theories behind previous studies may not jeopardize the preferences and the motive of the managers to engage in EM activities.

The theoretical underpinning of this study is the Agency Theory. Nevertheless, we would put forward other supporting theories, i.e., Prospect Theory and Opportunistic Management Theory to support our hypothesis in this study. Based on the Agency Theory, information asymmetry occurs when there is a separation between the management interest and the benefits to owners of the firms (Jensen and Meckling, 1976). The relationship between the executive and the shareholder was first modelled as Theory X by organizational psychologists (McGregor, 1960). This is where there is a conflict of interest between the principal (e.g., shareholders) and the agent (e.g., company executives) that arises when information asymmetry exists between the two parties (Jensen and Meckling, 1976). The issues that normally arise from this agency problem are moral hazards and adverse selection by managers. In reality, adverse selection is the main driver for choosing certain options to reduce the risk of earnings management detection (Hansen, 2001). Agency costs could either lead to the opportunistic behaviour of managers in managing earnings in an aggressive manner to benefit their own goals, or improve the communication of private information that is seen as beneficial to shareholders (Chen *et al.*, 2010; Cohen *et al.*, 2008a; Jiraporn *et al.*, 2008; Subramanyam, 1996). Managers exercise their discretion to improve the ability of earnings to reflect fundamental values (Subramanyam, 1996) and, therefore, enhance the information value of earnings to shareholders.

We would like to borrow an economic theory developed by Kahneman and Tversky (1979), the Prospect Theory, to explain the relationship between EM activities, restructuring, and their performance in addition to the said theories. This theory explains the way people choose between probabilistic alternatives that involve risk. People are aware of risks and benefits of certain actions and the choices they make. People are normally prone to choosing options that benefit them and allows for gain, even though the gain is half of the costs of choosing that action. As suggested by Rangan (1998, p. 103):

> *"Restructuring firms can raise capital of more favourable terms than if earnings were not managed but the benefit of EM is partially offset by its expected costs to issuing firms and their managers if EM were discovered…. Additionally, the discovery of EM could reduce the credibility of issuing firms' financial statements and hence impair their subsequent."*

The above statement clearly explains the prospect theory by elaborating on the choices and risks faced by target firms when engaging in EM activities before restructuring. Even though Rangan (1998) does not mention this theory to explain his research, we find his explanation to be in line with the prospect theory that we borrowed to explain the relationship between the EM activities and the factors and, consequently, the firm performance. To us, this theory complements the opportunistic behaviours of managers that are involved in restructuring firms. This considers the opportunity as well as the best decision when it comes to the decision to engage in EM activities.

As being reviewed by Feldman and McGrath (2016), finance literature views divestitures as a solution to the internal and external problems created by rent-seeking managers of diversified firms, while the strategy literature treats divestitures as a proactive tool that value-maximizing managers can use to improve the internal functioning and external perceptions of their firms. Interestingly, in finance literature, the discussion is on the use of divestiture to resolve the agency problems. However, neither literature could preclude managers of parent targets from potentially having negative consequences of involvement in EM activities. Due to limited past literature that have studied each of the divestitures and the relationship with EM activities in-

depth, it is very challenging for us to predict the direction of the outcomes of our analysis for each of the four types of restructuring.

A paper by Anagnostopoulou and Tsekrekos (2015) serves as the key paper for us to develop our hypotheses in terms of the relationship between the EM activities and the restructuring announcement. They study the EM in US firms that sought buyers between 1990 and 2012. They provide evidence of downward EM with a sample of target firms that they classify as 'seeking a buyer', and that have both time and motive to engage in such actions. They find that 'seeking a buyer' firms engage in overrepresentation of downward EM in the years surrounding the year of announcement. Furthermore, they find that the downward EM is negatively associated with the possibility of being acquired in a reasonable time period. They claim that there is an indication of efficient diligence by buyers that prefer to acquire firms that show low performance and growth.

Powers (2003) highlights the financial rationale of subsidiaries with regard to restructuring by carve-outs. In line with this motive, we attempt to link these carve-out activities as one of the factors that could be the variable behind parent firms' managing earnings around the restructuring announcement events. A carve-out is the most effective financing method available to parent firms with regard to generating cash (Powers, 2003). We suggest that parent companies have both motive and time to manage their earnings to attract investors. Carve-outs differ from IPO in that the parent firm continues to hold a substantial fraction of equity of the carved-out subsidiary. IPOs are firms that transform their status from a privately held to a public company. IPO firms have a tendency to engage in income-increasing to influence the initial offer prices (see e.g., Teoh *et al.*, 1998a). In addition, IPOs are involved in substantial organizational operational transformations and fundamental changes in operational structures (see e.g., Jain and Kini, 2008).

IPO firms typically exhibit high information asymmetry and the involvement in EM activities is for opportunistic purposes (Chen *et al.*, 2013). IPO engage in EM to window dress their financial reporting and boost their IPO initial selling price (Gao et al., 2017). Several past literature examine the relationship between the institutional investors and

the engagement of IPO in EM activities (see e.g., Gao *et al.*, 2017; and Lo *et al.*, 2017). Gounopoulos and Pham (2017) examine the impact of firms having credit rating on EM by IPO and find that rating existence is negatively associated with income-increasing AM and RM in the offering year.

Gao *et al.* (2017) examine both elements of EM i.e., AM and RM activities of IPO firms in China and analyse how institutional investors react to the issuing firm's pre-IPO EM. Taking a sample comprises of 472 IPO firms, they find that institutional investors bid's prices are negatively correlated with pre-IPO EM. The results are more pronounced for AB than RM. They also suggest that the long-run IPO performance is unrelated to EM.

Lo *et al.* (2017) examine US IPO firms from 1990 to 2013 and analyse the roles of institutional investors in EM activities during IPO issuance and the effect on post-IPO performance. They suggest that institutional investors have incentives to opportunistically maximize their wealth by manipulating earnings when firms engage in IPOs.

Research on EM around IPO mainly focused on the firms' engagement in AM activities around the IPO offering year (Teoh *et al.,* 1998a; Lo *e al.*, 2017). Evidence on RM by IPO issuers is less documented. Gao *et al.* (2017) claim that the engagement in AM activities is more pronounced in AM rather than in RM.

However, we suggest that to rely on IPOs empirical evidence to predict carve-outs' managers behaviour and motive is very judgemental and misleading. Furthermore, an equity carve-out, also known as a partial sell-off (Madura and Nixon, 2002).

In addition to the above discussion on IPO, Cohen and Zarowin (2010) find the evidence of RM around SEO, and document a greater decrease in post-SEO operating performance due to RM rather than AM.

We predict that parent targets that are involved in carve-outs, sell-offs, spin-offs, and other divestitures have a tendency to engage in income-decreasing EM activities to increase the chances of being acquired.

Building on the above foundation, we seek to examine whether EM activities are used as EM activities surrounding restructuring announcement events. Therefore, in alternative form, our first hypothesis is:

H1: Target firms that engage in corporate reorganization and restructuring (carve-out, sell-off, spin-off and divestiture) have a tendency of engaging in earnings management activities (AM and RM activities).

3.2.2 The Effect of Earnings Management (EM) on Firm's Performance

It becomes an evolving area in the related literature in EM to examine consequent effects of earnings management (EM) manipulation activities on firm future performance. Despite the large amount of literature on EM activities of firms involved in restructuring and acquisitions, there are a very limited number of papers that examine the link between EM and the firms' performance and stock volatility, especially for firms that are involved in carve-outs, sell-offs, spin-offs, and divestitures.

We examine EM with regard to the restructuring events because, as Lo (2008) suggests, EM activities are also crime cases that require both motive and opportunity. It is clear that parent targets do have motive and opportunity as they are in the process of restructuring, as well as generating assets for their operations. We analyse the EM activities and relate them to firm operating and stock performance. Previous literature agrees that management intervention in reporting accounting data could affect firms' returns and stock prices.

Bergstresser and Philippon (2006) find that the use of discretionary accrual to manipulate reported earnings is more pronounced at firms where the CEO's potential total compensation is more closely tied to the value of stock and option holdings. Hewitt *et al.* (2016) use an experiment to examine the differential effects of the methods of both accrual-based and real EM on shareholders' assessments of a firm's cash flows and trust in the firm's managers, and ultimately shareholders' investment decisions. They find that accruals-based EM is costly because it adversely affects shareholders' trust in managers and ultimately their willingness to invest in a firm while real EM does not.

Previous studies have focussed on the effects of these decisions on the parent firm, and have found positive returns in response to each type of announcement (i.e., carve-out, sell-off, spin-off and divestitures). Prior research argues that the positive returns to parent firms reflect potential improvement in public understanding of subsidiary value, especially regarding carve-outs and spin-offs. Assets sell-offs also improve the firm parent value by transferring the ownership and control of a subsidiary to firms that can better utilize those assets. To the best extent to our knowledge, there is only one study that studies the relationship between EM activity and firms' performance. Balatbat and Lim (2003) examine the accrual-based EM manipulation activity of target parent companies and relationship with buy-and-hold abnormal returns: they examine 326 carve-out offerings during 1982-1997. They find that firms that aggressively manage their earnings using accrual-based EM activity have poor performance after the announcements. The difference between carve-outs and other types of restructuring is the reduction in the ownership of the parent firms. With spin-offs, sell-offs and divestitures, the parent firms eliminate their involvement in the subsidiary (Slovin *et al.*, 1995).

Corporate restructuring, especially divestiture, has been an identified as an important strategic action as it has a positive impact on firm performance (see also Bergh, 1995; Feldman, 2014; Kolev, 2016). Berry (2010) shows that divestiture is not only a choice that managers make when dealing with a poor or struggling operation, but it is also a response to better opportunities, it plays an important role in firm growth, creates more efficient uses of firm resources, and develops better prospects for firm growth. There is an relationship between EM and subsequent declines in firm performance (e.g., Cohen and Zarowin, 2010; DuCharme *et al.*, 2004; Rangan, 1998; Shivakumar, 2000; Teoh *et al.*, 1998b).

Cohen and Zarowin (2010) analyse both accrual-based and real EM activities manipulation around the seasonal equity offering (SEO) based on a sample of 1,511 completed US offers between 1987 and 2006. They find that SEO firms have a greater tendency to be involved in real EM activities rather than in accrual-based EM. The effect on post-SEO performance is more severe for those firms engaging in real activities'

manipulation. This research is essential to our study as it acts as a basis on which we can examine earning management activities to other types of restructuring.

Dechow *et al.* (2011) have developed a financial mis-statement database to analyse the financial characteristics of mis-stating firms. In this regard, they have developed a model to predict mis-statements. The output of their research is a scaled probability (F-score). They use this method as a red flag, or signal, of the likelihood of EM or mis-statement. They use the accrual-based EM as part of the model to predict the mis-statements.

Past studies claim that the stock market responds positively to divestiture announcements (see Comment and Jarrell, 1995; Daley *et al.*, 1997; Desai and Jain, 1999; John and Ofek, 1995; Krishnaswami and Subramaniam, 1999). Kothari *et al.* (2016) examine the role of accrual-based (AM) and real manipulation (RM) in inducing overvaluation at the time of the SEO. Taking the SEO sample for a period between 1970 to 2012, they analyse the stock performance of SEO and non-SEO firms: their findings are consistent with Cohen and Zarowin (2010). They find that EM via both AM and RM activities is associated with poor future earnings performance. However, post-SEO stock market underperformance is more predictable when it is driven by RM activity.

Our second objective is to investigate whether a relationship exists between the post-announcement performance and the EM activities' manipulation. We explore the cross-sectional determining factor of the choices firms make; this is between those firms that have managed their earnings above earnings management (AEM) proxy and those that have managed their earnings below earnings management (BEM) proxy. This analysis is important to comprehend why certain firms choose a specific way of managing earnings around the year of the restructuring announcements. We focus on both the AM and RM as the proxies for EM activities. We also examine the relationship between the various factors of the post-restructuring performance of the target parents with the specific type of EM activities.

EM activities are unlike fraud. They involve the selection of accounting procedures and estimates that conform to generally accepted accounting procedures (GAAP). The manifestation of target EM activities would be within the bounds of accepted accounting

procedures. Because this is true, the acquiring firms cannot prevent accounting procedure manipulation by the parent targets involved in restructuring.

Carve-outs, sell-offs, spin-offs, and divestitures are unique. To understand the effects of EM activities of parent targets on firms' performance, we based our prediction using our joint hypothesis. Restructuring is used to generate cash flow to parent targets and divest a subsidiary that is undervalued.

We examine the immediate stock market response to restructuring announcements, which can be calculated using an event study (Anand and Singh, 1997). On one hand, Gao *et al.* (2017) suggest that the long-run IPO performance is unrelated to EM. On the other hand, Lo *et al.* (2017) provide an evidence that institutional investors facilitate AM before IPO but restrain EM after their issuance. They also find that firms with high institutional investors experience higher post-IPO stock return and operating performance. To be consistent with the previous study on EM, we study the subsequent operating performance and stock performance as a function of the EM method used around the restructuring announcement events. Therefore, our second hypothesis is as follows:

H2: The post-restructuring performance of firms is related to the factors that contribute to the choices made by the firms with regard to managing their earnings.

3.2.3 The Effect of Earnings Management (EM) on Firm's Stock volatility

Our third objective is to examine the relationship between EM activities and the stock volatility of target parents. Previous studies suggest that EM activities could affect stock returns. Based on the agency theory, firms that manage earnings above earnings management (AEM) index have a higher tendency to have information asymmetry, as measured by the volatility of the stock returns. The stock volatility can also be used as the proxy of information asymmetry (e.g. Linck *et al.*, 2008). A previous study suggests that most of the motivations for EM are aimed at sustaining a positive perception of the firm in the market and to avoid a decline in share price (Campa and Hajbaba, 2016). The analysis of the stock volatility is very important because it might at least partly capture

the cash flow risk of a firm (Harford *et al.*, 2014). Furthermore, Cyert *et al.* (1997) find that CEO compensation is higher at firms with greater stock return volatility. In line with that finding, executives understand that the expected value of a stock option increases with the volatility of the stock price and that executives tend to respond to stock option awards by investing in riskier projects (Larcker *et al.*, 2014). This could be also be true in the case where parent targets engage in divestitures in order to focus more on the core business and to invest in other more profitable projects.

Many studies try to explain why carve-outs enhance the wealth of shareholders. Based on the rationale efficiency theory explained by Powers (2003), and consistent with the argument by Slovin *et al.* (1995), Slovin and Sushka (1997), and Nanda (1991), they argue that carve-outs are a means of improving access to both over and undervalued stock markets. The argument is that there is information asymmetry between the manager of the parent company and the investors. By raising cash through carve-outs, the stock markets perceive the stock of the subsidiary as overvalued, and the parent stock as undervalued. This idea is supported by Gleason *et al.* (2006); they find that there is a positive reaction to stock prices of both parents and subsidiaries in response to the announcement of a reacquisition after a carve-out. This is due to the belief that the subsidiary shares are undervalued. Furthermore, Schipper and Smith (1986) suggest that the separation of financial information between the parent company and their subsidiary could enhance the level of information from which investors benefit.

Otsubo (2009) examines the stock price of parent firms around the carve-out announcements. He studies the wealth effect associated with the combination of four subsequent events: merger and acquisition activity, secondary offering, spin-offs, and reacquisitions. Taking 201 carve-outs conducted by nonfinancial firms in the US, the study finds that the stock market reacts positively toward the stock of a parent company when they preserve the parent-subsidiary relationship after a carve-out. The main finding is that the parent company stock price does not react positively to M&As in the first event. The market expects secondary events when firms announce carve-outs, and evaluate the combination of events on the announcement of the carve-out.

Firms that engage in restructuring might be involved in EM activities as they have the motive and opportunity to do so. This could be true for firms for which executive compensation is highly related with the firm's performance. Therefore, our third hypothesis is as follows:

H3: Target firms that engage in EM activities have a tendency of having high stock return volatility.

3.2.4 Substitution between real and accrual-based EM

Finally, our objective is to examine whether there is any substitution or complementarity between the choice of the type of earnings management activities between real (RM) and accrual-based (AM) activities among the firms that are involved in restructuring. The introduction of SFAS 146 in 2002, make it more difficult for managers to manipulate firms accounting figures (Ewert and Wagenhofer, 2005). Managers can manipulate their reported earnings through real activities' manipulation by giving excessive sales discounts to increase sales at the end of the year, or by timing the sale of assets to recognize gains in a distress period (Nagar and Sen, 2016). Real earnings manipulation (RM) has adverse future performance implications for the bidders and targets. The literature on RM is limited as compared to that on AM.

It is difficult for auditors and regulators to detect real earnings' manipulation activities as managers can always justify the level of spending or production (Ewert and Wagenhofer, 2005). This is what Cohen *et al.* (2008a) claimed; real earnings' management activities seem to have increased post-SOX. Due to the agency problem and prospect theory, managers seem to opt for the best ways to carry out their duties, while at the same time try to reduce the risk that gives major impact on their performance and reputation. The blame should not only lie with the managers' side. The engagement on EM manipulation activities could be related to the industry where the firm operated. Other factors such as the reputation of auditors, the level of liquidity of the firms as well as the accruals earnings management flexibility could affect the behaviour of managers between the two types of EM.

In our study, we explore the cross-sectional determinants of the selections restructuring firms make between different earnings manipulation activities a year before the restructuring to understand why firms choose a certain type of EM activity a year before the restructuring year. We follow Cohen and Zarowin (2010) for the final hypothesis:

> *H4: The decision by firms that are involved in restructuring to manage earnings by real activities manipulation versus accruals-based manipulation is related with auditor characteristics, litigation probability, and accruals management flexibility (as captured by net operating assets).*

In the following section, we discuss the empirical methodology employed to test all hypotheses discussed above.

3.3 Empirical Methodology

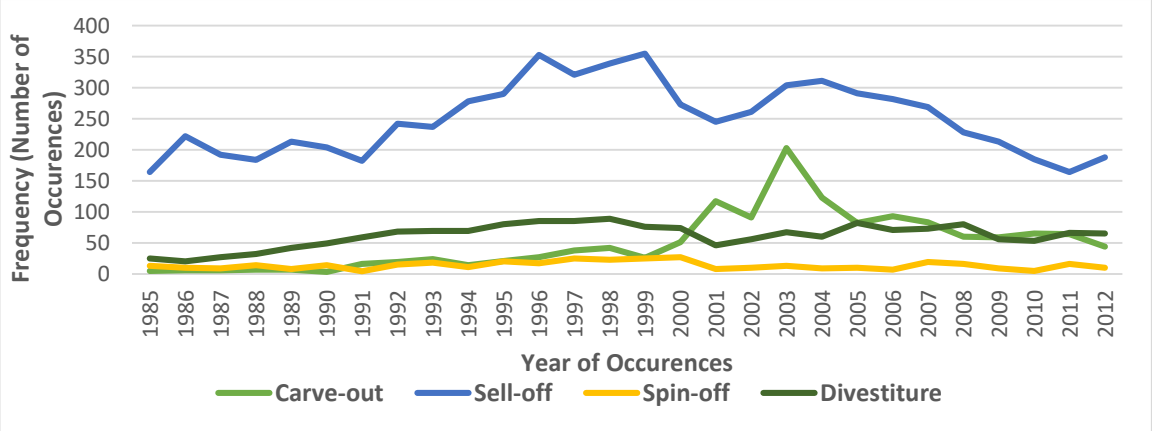
3.3.1 Data and Sample Description

To test whether firms that are involved in restructuring their organizations engage in EM activities, we construct a sample firm for empirical tests by merging the Mergers and Acquisitions Database and Equity Database, from Thomson One Database, with the Center for Research in Security Prices (CRSP)/COMPUSTAT Merged Database, for the period from 1985 to 2015. The CRSP returns cover NYSE, AMEX and NASDAQ stocks. We exclude financial firms with Standard Industrial Classification (SIC) codes between 6000 and 6999 because they usually hold substantial inventories of marketable securities; these are included in the net operating assets measures. We also exclude transportation and public utility firms with SIC codes between 4000 and 4999 because cash holdings of these firms are subject to regulatory supervision. Accounting and financial data are obtained from COMPUSTAT. All databases are accessed via Wharton Research Data Services (WRDS). To compute cumulative abnormal returns (CARs) and buy-and-hold abnormal returns (BHARs), and standard deviation of monthly stock returns (SDARs) we used the Eventus database. We only consider firms with exchange codes of 11, 12 and 14 in Compustat. We collect the financial information, and other relevant data, for the sample. We use the financial data for $t-5$ to $t+3$ for our study. We ensure that each

firm-year observation has the data for us to calculate the accrual-based and real EM metrics that we use in our study. We provide the description of all variables used in this study in Appendix 6.

Firms involved in sell-offs have higher book-to-market ratios, averaging at around 0.45 (please refer to Appendix 7). From an economics viewpoint, the figure could explain the reason why parent firms sell off their assets. The subsidiary of a parent that is involved in a carve-out tends to have low book-to-market ratios, averaging at around 0.40. This is consistent with the previous study of SEOs that engage in EM activities; this states that firms with high market valuations have more tendency to issue equity (see Teoh *et al.*, 1998a; Rangan, 1998; Cohen and Zarowin, 2010). In 2003, following the introduction of the Sarbanes-Oxley Act 2002 (hereafter SOX), the number of restructuring announcements made was the highest, at around 14.54%, equivalent to 203 carve-out announcements. The highest number of announcements made for sell-offs, spin-offs and divestitures were in the years before 2002. For example, the highest number of announcements for sell-offs, spin-offs and divestitures were in 1996, 2000 and 1998 respectively. The second highest number of announcements for spin-offs was in 1999, 25 out of a total of 385 announcements. This scenario is not surprising as the stock market thundered during the period from 1991 to 1999 (Cohen and Zarowin, 2010). For a major comprehension, we present the line plot of the sample distribution in Figure 3.1.

Figure 3.1: Line Plot for the Frequency of Carve-Out, Sell-Off, Spin-Off, and Divestiture



Source: Compiled by author from data obtained from Thomson One Banker

3.3.2 EM Metrics

To calculate accrual-based and real EM proxies, we apply cross-sectional models, following Cohen and Zarowin (2010), where for each year we estimate the EM models for every industry classified by its 2-digit SIC code. Using this method allows us to control partially for any changes in economic conditions that relatively affect total accrual-based and real EM manipulation activities. The results need to be interpreted cautiously as they are probably reflecting the changes in a firm's economic circumstances rather than the EM manipulation activities (Kasznik, 1999; DeFond and Jiambalvo, 1994; Cohen and Zarowin, 2010). Finally, the *TOTAL EM* is calculated based on whether a firm is classified as an earnings management firm year observation or not. It is an indicator variable that gets the value of one if either of the real earnings management activities aggregate proxies either (RM_1 or RM_2), or discretionary accruals are above the industry year median following the method by Cohen and Zarowin (2010). A detailed explanation of the metrics is given in the following section.

3.3.2.1 Accrual-based Model

Our method of calculating the discretionary accruals is based on the following cross-sectional model, estimated for each two digits SIC-year grouping using Jones' (1991) model. This is as follows:

$$\frac{TA_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{\Delta SALES_{i,t}}{Assets_{i,t-1}} + k_3 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \varepsilon_{it} \tag{3.1}$$

where for year *t* and firm *i*, TA represents the total accruals defined as:

$$TA_{i,t} = EBXI_{i,t} - OCF_{i,t} \tag{3.2}$$

where EBXI is the earnings before extraordinary items and discontinued operations (Compustat data item #123), and OCF is the operating cash flows (from continuing operations) taken from the statement of cash flows (Compustat data item #308 *minus* Compustat data item #124). We follow closely the methods used by Cohen and Zarowin (2010).

$Assets_{i,t-1}$ represents total assets (Compustat data item #6). $\Delta SALES_{i,t}$ is the change in revenues (Compustat data item #12) from the preceding year, and $PPE_{i,t}$ is the gross value of property, plant and equipment (Compustat data item #7).

The coefficient estimates from equation (3.1) are used to estimate the firm-specific normal accruals ($NA_{i,t}$) for our sample firms. The firm-specific normal accruals $NA_{i,t}$ is estimated using the following formula:

$$NA_{i,t} = \hat{k}_1 \frac{1}{Assets_{i,t-1}} + \hat{k}_2 \frac{\Delta SALES_{i,t}}{Assets_{i,t-1}} + \hat{k}_3 \frac{PPE_{i,t}}{Assets_{i,t-1}} \quad (3.3)$$

where the discretionary accruals ($DA_{i,t}$) is the difference between total accruals and the fitted normal accruals, defined as:

$$DA_{i,t} = \left(\frac{TA_{i,t}}{Assets_{i,t-1}}\right) - NA_{i,t} \quad (3.4)$$

3.2.2.2 Real Earnings Management

We follow the real earnings management model by Roychowdhury (2006) to calculate the real earnings management proxies in this study.

Abnormal cash from operations are estimated as the deviations from the predicted values from the following industry year regression:

$$\frac{OCF_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta SALES_{i,t}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (3.5)$$

where OCF is cash flow from operations (Compustat data item #308 minus Compustat data item #124); SALES are annual sales revenues (Compustat data item #12) and Assets are total assets (Compustat data item #6). Abnormal production costs are estimated as the deviations from the predicted values from the following industry year regression:

$$\frac{PROD_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta SALES_{i,t}}{Assets_{i,t-1}} + k_4 \frac{\Delta SALES_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (3.6)$$

where PROD are production costs, defined as the sum of costs of goods sold (Compustat data item #41) and change in inventory during the year (Compustat data item #3). Abnormal discretionary expenses are estimated as the deviations from the predicted values from the following industry-year regression:

$$\frac{DISX_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{it} \quad (3.7)$$

where DISX are discretionary expenses during the year, and are defined as the sum of advertizing expenses (Compustat data item #45), R&D expenses (Compustat data item #46) and SG&A (Compustat data item #189).

Following the method by Zang (2012) and Cohen and Zarawin (2010), we break down the element of real earnings management into RM_1 and RM_2. The formula to calculate them is as follows:

$$RM\_1 = abnormal\ discretionary\ expenses\ X\ (-1) + abnormal\ production\ costs \quad (3.8)$$

$$RM_2 = abnormal\ cash\ flows\ from\ operations\ X\ (-1) + abnormal\ discretionary\ expenditures\ X\ (-1) \quad (3.9)$$

RM_1 takes the value of 1 if the figure is lower than the industry year median *RM_1* and 0 if otherwise. *RM_2* takes the value of 1 if the figure is lower than the industry year median *RM_2* and 0 if otherwise.

The next section is the explanation regarding the regression on EM with other variables in this study. The higher RM_1, the more likely that firms will increase their production and cut discretionary expenditures to manipulate earnings upward. Also, the

higher RM_2, the more likely that firms manipulate sales and reduce discretionary expenditures to report higher earnings.

3.3.3 Multiple Regression

3.3.3.1 Regression on EM

We run the 2-stage HSM to explain the determinants of EM activities and the effect of those activities to the firm performance and stock volatility. The first stage model to explain the decision to manage earnings:

Our first stage explains a firm's decision to manage reported earnings. We interpret the results based on the factors that contribute to the choices made by the firm as whether to manage earnings aggressively above the industry year median EM index (hereafter AEM), or aggressively manage their earnings below the industry year median EM index (hereafter BEM). The following is the function of EM that we use for the first stage regression following the model by Cohen and Zarowin, (2010). From the first regression, we will calculate the inverse mills ratio (hereafter IMR) to correct the selection bias in our analysis.

$$\begin{aligned} EM_{it-1} = \ & \alpha + \beta_1 ROA_{i,t} + \beta_2 OPTION_{i,t} + \beta_3 BONUS_{i,t} \\ & + \beta_4 SHARES_{i,t} + \beta_5 MKT\_CAP_{i,t} + \beta_6 B\_M_{i,t} \\ & + \beta_7 HAB\_BEAT_{i,t} + \beta_8 ANALYST_{i,t} \\ & + \beta_9 LEVERAGE_{i,t} + \varepsilon \end{aligned} \tag{3.10}$$

Where EM_{it-1} is the earnings management index calculated using Jones' (1991) model and coded as 1 if the index of the firm *i,* is AEM index and 0 if the index is BEM index. The index is measured taking the year t-1 data. $ROA_{i,t+1}$ is the return on assets and is defined as income before extraordinary items divided by beginning of period total assets less the industry year median for the year t+1. $OPTION_{i,t}$ represents the Black-Scholes value of option compensation as a proportion of total compensation received by the CEO and the CFO of a firm i. $BONUS_{i,t}$ is the average bonus compensation as a proportion of total compensation received by the CEO and the CFO of a firm. $SHARES_{i,t}$ is the weighted average number of common shares outstanding at the beginning of the

year, before the restructuring. $MKT\_CAP_{i,t}$ is market value of equity and is calculated as the closing price at fiscal year-end multiplied by the number of shares outstanding at fiscal year-end. $B\_M_{i,t}$ is the book-to-market ratio, where the book value of common equity is divided by market value of equity. $HAB\_BEAT_{i,t}$ is the frequency of meeting/beating analysts' earnings forecasts in the past four quarters of the announcement. $ANALYST_{i,t}$ is the number of analysts following the firm. $Leverage_{i,t}$ is the sum of short-term and long-term debt divided by average total assets.

Finance literature on EM has studied the variable of ROA and the association with EM activities (see Cohen and Zarowin, 2010; Kothari *et al.*, 2016; Nagar and Sen, 2016; Rahman *et al.*, 2016; Zang, 2012). We include both managerial and capital market incentives to manage earnings in our estimation to model the determinants of a firm's decision to manage earnings. For managerial incentives, *OPTION* and *BONUS* are included as recent research suggests that excess compensation is associated with EM activities. It is claimed that stock-based compensation and management ownership could motivate managers to trigger them to engage in EM activities and, consequently, build up the stock prices (e.g., Bergstresser and Philippon, 2006; Cheng and Warfield, 2005; Coffee Jr, 2003; Cohen and Zarowin, 2010; Fuller and Jensen, 2002; Greenspan, 2002, among others). *OPTION and BONUS* are included as variables in our estimation. It is believed that these two variables could induce opportunistic behaviour in managers to manage earnings (Cohen and Zarowin, 2010). We retrieve compensation data from the EXECUCOMP database; these are only available from 1992 onwards. The merged samples of all four types of divestitures or restructuring are for the period 1990 to 2012.

We also include the variable *HAB_BEAT* and *ANALYST* as variables to estimate the likelihood of the firm to manage earnings. These variables are the proxies for capital incentives in our estimations. Past literature documents that meeting or beating analyst's earnings forecast enjoys higher returns (Bartov *et al.*, 2002; Kasznik and Mcnichols, 2002). Cohen and Zarowin (2010) confirm the importance of *HAB_BEAT* as they find that firms that constantly meet or beat analyst's earnings forecast have a stronger incentive to manage earnings, and to keep meeting or beating those targets to avoid adverse stock price if they fail to do so. The variable *ANALYST* serves as a determinant of a firm to engage in EM activities. In addition to the role of *ANALYST* as

the monitoring role over firms' activities, it might be an incentive for firms to engage in EM activities as they try to meet or beat analysts' forecast targets.

Finally, we also include variables such as *MKT_CAP, LEVERAGE,* and *B_M,* based on the evidence discussed in the EM literature (e.g., Cohen and Zarowin, 2010; Fields *et al.*, 2001; Healy and Wahlen, 1999) to control for variations in size, capital structure and growth respectively, that might include measurement errors that are correlated with firm characteristics. The following section gives an explanation on the performance proxies that we use in this study.

3.3.3.2 Performance Proxies

3.3.3.2.1 Performance- ROA-industry median adjusted

For comparison purposes with the previous study, we follow Cohen and Zarowin (2010). We defined our ROA as industry year adjusted return on assets, where the return on assets is defined as income before extraordinary items divided by beginning of period total assets less the industry year median. We use the changes in ROA (ΔROA) as the measurement for the changes in performance for the univariate test and the HSM.

We regress the ΔROA on the measures of EM, control variables and the IMR calculated from the first-stage regression. To test the effect of EM on ΔROA and other control variables, we estimate the following regression equation:

$$\begin{aligned} \Delta ROA_{it} = \ & \alpha + \beta_1 EM_{i,t-1} + \beta_2 SOX_i + \beta_3 OPTION_{i,t} + \beta_4 SHARES_{i,t} \\ & + \beta_5 MKT\_CAP_{i,t} + \beta_6 BM_{i,t} + \beta_7 HAB\_BEAT_{i,t} \\ & + \beta_8 ANALYST_{i,t} + \beta_9 LEVERAGE_{i,t} + \beta_{10} IND\ CONC_{i,t} \\ & + \beta_{11} IND\ LEVERAGE_{i,t} + \beta_{12} IND\ ROA_{i,t} \\ & + \beta_{13} IND\ M\_B_{i,t} + \beta_{14} IMR_{i,t} + \varepsilon \end{aligned} \tag{3.11}$$

where $\Delta ROA_{i,t}$ is the change in return on assets and is defined as the average difference in income before extraordinary items, divided by beginning of period total assets, less the industry year median for the year post-restructuring and pre-restructuring, EM_{it-1} earnings management index, calculated using Jones' (1991) model and coded as 1 if the index of the firm *i,* is AEM index and 0 if the index is BEM index. We include control variables in Equation (3.11) as suggested by prior EM literature. Definitions of all variables are presented in Appendix 7.We include the variable SOX. The detection of

these real manipulation activities (RM) by auditors and regulators is very difficult as managers can always justify the level of spending or production (Nagar & Sen, 2016).Cohen *et al.* (2008) also document changes in managerial choices of EM methods towards more RM after the passage of SOX. Hence, we include this variable in our estimation on the changes in ROA. We also include *SHARES* and *HAB_BEAT variable in our regression on the changes in ROA*. The justification of including these two variables are almost the same. We add the variables of *SHARES* as what has been highlighted by Zang (2012) that *SHARES* are correlated with the EM activities that could also be correlated to the changes in ROA. We account for several firm characteristics that may determine the changes in ROA in the year after the issuance. We include *MKT_CAP, LEVERAGE,* and *B_M,* based on the evidence discussed in the EM literature (e.g., Cohen and Zarowin, 2010; Fields *et al.*, 2001; Healy and Wahlen, 1999) to control for variations in size, capital structure and growth respectively, that might include measurement errors that are correlated with firm characteristics. The variable, *ANALYSTS* is also included in the estimation on the changes in *ROA*. Firms that meet or beat analysts' earnings expectations, enjoy a higher return over the year/ quarter than firms with similar yearly/ quarterly earnings forecast errors that fail to meet these expectations (Bartov *et al.*, 2002; Comprix *et al.*, 2006).

Following Aktas *et al.* (2016), we include the target industry characteristics, such as *INDUSTRY CONC, INDUSTRY LEVERAGE, INDUSTRY ROA,* and *INDUSTRY M_B* as one of the control variables in our estimation in the above regression. Most of the variables used to estimate the likelihood of the firm's engagement in EM activities, are also used in our estimation of the association between the firm performance and the engagement of firms in EM activities.

3.3.3.2.2 Short-Term Performance – Cumulative Abnormal Returns (CARs)

We calculate cumulative abnormal returns (CARs) for the announcing firms in the three-day event window (−2, 0), (-1, +1), and (0, +3) around the announcement day. Normal returns are estimated using the classical market model and the value-weighted CRSP index as a proxy for the market portfolio. We also use the Fama-French three-factor and Momentum Model for the estimation. The parameters of the market model and Fama-

French three-factor and Momentum Model are estimated over a 255-day event window (−255, −46), around the announcement day. To test the effect of EM on CARs, we estimate the following regression:

$$\begin{aligned} CAR_{i,t} = \ & \alpha + \beta_1 EM_{i,t-1} + \beta_2 SOX_i + \beta_3 OPTION_{i,t} + \beta_4 SHARES_{i,t} \\ & + \beta_5 MKT\_CAP_{i,t} + \beta_6 BM_{i,t} + \beta_7 HAB\_BEAT_{i,t} \\ & + \beta_8 ANALYST_{i,t} + \beta_9 LEVERAGE_{i,t} + \beta_{10} IND\ CONC_{i,t} \\ & + \beta_{11} IND\ LEVERAGE_{i,t} + \beta_{12} IND\ ROA_{i,t} \\ & + \beta_{13} IND\ M\_B_{i,t} + \beta_{14} IMR_{i,t} + \varepsilon \end{aligned} \tag{3.12}$$

where $CAR_{i,t}$is the cumulative abnormal return (CARs) for 3-day event window (-2,0) and (-1, +1). Our main independent variable is EM_{it-1}. EM_{it-1} is the earnings management index calculated using Jones' (1991) model and coded as 1 if the index of the firm *i,* is AEM index and 0, if the index is BEM index. The index is measured taking the year t-1 data. We include control variables in Equation (3.12) as suggested by prior studies (see Chen *et al.*, 2010; Zang, 2012; Chen *et al.*, 2013; Aktas *et al.*, 2016). Definitions of all variables are presented in Appendix 6.

We account for several firm characteristics in our equation. We include *MKT_CAP, LEVERAGE,* and *B_M,* based on the evidence discussed in the EM and restructuring literature (e.g., Cohen and Zarowin, 2010; Fields *et al.*, 2001; Healy and Wahlen, 1999) to control for variations in size, capital structure and growth respectively, that might include measurement errors that are correlated with firm characteristics. We include the target industry characteristics, such as *INDUSTRY CONC, INDUSTRY LEVERAGE, INDUSTRY ROA,* and *INDUSTRY M_B* as one of the control variables in our estimation in the above regression. We also examine the effect of EM activities on the firm's stock volatility in this study. The following section will explain the stock volatility methodology that we used in this study.

3.3.3.2.3 Long-Term Performance - Buy-and-Hold Abnormal Returns (BHARs)

Barber and Lyon (1997) highlight the benefit of Buy-and-Hold Abnormal Returns (BHARs) for measuring the investor's involvement in the long-run, because the use of cumulative returns does not adequately measure the returns obtained by an investor who holds stock for a long period. Given that there is no consensus about which approach is the

best between CARs and BHARs, and in order to give robustness to the results, both the CAR and BHAR approach was used. Our main analysis utilises Buy-and-Hold Abnormal Returns (BHARs), but we also report Buy-and-Hold Returns (BHRs). BHRs of firms are used to calculate the BHARs of firms in the sample. We calculate both BHAR and BHR for the announcing firms in 12, 24 and 36-month event windows (1, +12), (1, +24), and (1, +36) after the announcement day (see eg.,(Agrawal & Jaffe, 1999; Jory & Madura, 2009, 2010; Jory et al., 2012; Li, Qiu, & Shen, 2014; Oh, 2014) . The BHARs are the difference between the BHRs of the market model and the Fama-French three-factor (FF) and Momentum Model (MM) for the same event window period. According to Barber and Lyon (1997), estimating long-run abnormal returns in response to events could potentially report biases. They suggest that the biases can be corrected by measuring the buy-and-hold share returns of the sample firms in comparison to their benchmarks (see e.g., (Blay, Bryan, & Reynolds, 2009; Gleason et al., 2006; Jory & Madura, 2009)Normal returns are estimated using the classical market model and Fama-French three-factor and Momentum Model, and the value-weighted CRSP index as a proxy for the market portfolio. We retrieve the BHRs data from the Eventus using Monthly Fama-French Basic Event Study query. The parameters of the market model and Fama-French three-factor (FF) and Momentum Model (MM) are estimated over a 36-month event window (−7, +36), around the announcement day. To test the effect of EM on BHARs, we estimate the following regression:

$$\begin{aligned} BHAR_{i,t} = \ & \alpha + \beta_1 EM_{i,t-1} + \beta_2 SOX_i + \beta_3 OPTION_{i,t} + \beta_4 SHARES_{i,t} \\ & + \beta_5 MKT\_CAP_{i,t} + \beta_6 BM_{i,t} + \beta_7 HAB\_BEAT_{i,t} \\ & + \beta_8 ANALYST_{i,t} + \beta_9 LEVERAGE_{i,t} + \beta_{10} IND\ CONC_{i,t} \\ & + \beta_{11} IND\ LEVERAGE_{i,t} + \beta_{12} IND\ ROA_{i,t} \\ & + \beta_{13} IND\ M\_B_{i,t} + \beta_{14} IMR_{i,t} + \varepsilon \end{aligned} \tag{3.13}$$

Where $BHAR_{i,t}$ is the buy-and-hold abnormal return for the event window (1, +12), (1,+24), and (1,+36). EM_{it-1} is the main variable of interest that is equals to 1 if the index of the firm *i* is AEM index, and 0 if the index is BEM index. The index is measured taking the year t-1 data.

We include the control variables in the Equation (3.13) following past studies (Chen *et al.*, 2010; Chen *et al.*, 2013; Aktas *et al.*, 2016). Definitions of all the variables are

presented in Appendix 6. We include time-varying industry characteristics such as *MKT_CAP, LEVERAGE,* and *B_M* (e.g., Cohen and Zarowin, 2010; Fields *et al.*, 2001; Healy and Wahlen, 1999). We examine the effect of EM activities on the firm's stock volatility in this study. The following section will explain the stock volatility methodology that we used in this study.

3.3.3.3 Stock Volatility

We collect the monthly stock return for 72 months, which ranges from 36 months before the announcement to 36 months after the announcement. We retrieve the monthly stock returns from the CRSP database using the Eventus software. We calculate the standard deviation of the monthly stock returns. We also calculate the standard deviation for the year t-1 and t-2 for the sample.

We use the standard deviation of monthly stock returns (SDARs)[10] to measure the volatility of the stock returns of the firms. We calculate the SDARs for the duration of the pre and post announcement, as well as the period t-1 and t-2 of the announcement, where t=0 is the year of the announcement. Measures based on stock returns standard deviations are used in volatility measures, and indices traded on the market are market-based. The stock returns volatility also serves as a proxy for information asymmetry (e.g. (Linck *et al.*, 2008) and uncertainty (e.g., Lee *et al.* 2008).

The following is the second-stage of regression that could explain the association between EM and SDARs:

$$\begin{aligned} SDAR_{i,t} = \ & \alpha + \beta_1 EM_{i,t-1} + \beta_2 SOX_i + \beta_3 OPTION_{i,t} + \beta_4 SHARES_{i,t} \\ & + \beta_5 MKT\_CAP_{i,t} + \beta_6 BM_{i,t} + \beta_7 HAB\_BEAT_{i,t} \\ & + \beta_8 ANALYST_{i,t} + \beta_9 LEVERAGE_{i,t} + \beta_{10} IND\ CONC_{i,t} \\ & + \beta_{11} IND\ LEVERAGE_{i,t} + \beta_{12} IND\ ROA_{i,t} + \beta_{13} IND\ M\_B_{i,t} \\ & + \beta_{14} IMR_{i,t} + \varepsilon \end{aligned} \tag{3.14}$$

[10] Previous study by Core *et al.* (1999), Low (2009), Cheng *et al.* (2015), Lee *et al.* (2008) among others, use the standard deviation of either daily stock returns or monthly stock returns as a proxy for risk or stock volatility in their study.

where $SDAR_{i,t}$ is the standard deviation of monthly annual return of firms for t+1 to +3. EM_{it-1} is our main independent variable of interest. EM_{it-1} is the earnings management index calculated using Jones' (1991) model and coded as 1 if the index of the firm *i* is AEM index and 0 if the index is BEM index. The index is measured taking the year t-1 data. We include the control variables following past literature (Aktas et al., 2016; Ali, Klasa, & Yeung, 2009; Madura & Murdock, 2012). Definitions of all variables are presented in Appendix 6. The next section will discuss the findings from our analysis in more detail. We start our discussion by presenting the descriptive statistics of the samples in our study.

3.4 Empirical Results

3.4.1 Empirical Evidence on Real and Accrual EM around Carve-Out, Sell-Off, Spin-Off and Divestiture

To understand the EM activities around firm restructuring and organization, we present the mean discretionary accruals and real earnings management proxies in Appendix 8. All variables are scaled by beginning year total assets for years t-3 to t+3 about the year of the restructuring. We winsorized the variables for all EM proxies at 1% and 99%, and reported the median of the proxies. Hypothesis H1 proposes that firms that engage in corporate reorganization and restructuring exhibit evidence of accrual-based and real EM activities. The results support hypothesis H1 and, interestingly, our results are inconsistent with previous findings of Rangan (1998), Teoh *et al.* (1998a), Shivakumar (2000), DuCharme *et al.* (2004); Cohen and Zarowin (2010) where they find significant and positive abnormal accruals in the year of the restructuring that exhibit the earnings enhancing practises. Our results find that there are significant and negative abnormal discretionary accruals in the year of restructuring, as well as the year before and after the carve-outs, sell-offs, spin-offs, and other divestitures. Thus, our sample reveals the opposite situation, i.e., earnings-reducing accruals management among managers of firms that engage in restructuring such as carve-outs, sell-offs, spin-offs, and other divestitures.

However, we find significant evidence of positive abnormal production costs and discretionary expenses, and negative abnormal cash flows from operations. The only

consistent results that we have with previous study in SEO i.e., by Cohen and Zarowin, (2010) are the positive abnormal production costs. Our finding for abnormal production costs is inconsistent with IPO literature, e.g., Gounopoulos and Pham (2017) and Gao *et al.* (2017) where they find negative abnormal production costs. However, our finding on abnormal cash flows from operation is consistent with Gounopoulos and Pham (2017) and Gao *et al.* (2017). For discretionary expenses, our finding is consistent with (Gao *et al.*, 2017). The patterns are almost the same for all four types of restructuring in this study. The patterns are not in the year of restructuring only, but have happened three years before and after the restructuring. This could imply that firms are involved in EM activities not only in the year of restructuring but also long before and after restructuring. Interestingly, the abnormal production costs median in the year of restructuring is very high and significant. The magnitude of the activities is very high in the year of restructuring as compared to the other years.

From an economics point of view, these findings suggest that targets could probably try to increase the chances of completing the whole process of restructuring during a reasonable time frame as has been claimed by Anagnostopoulou and Tsekrekos (2015). Downward EM negatively affects the probability of firms that are seeking buyers to close deals within a reasonable amount of time (Anagnostopoulou and Tsekrekos, 2015). We show the evidence that firms involved in carve-outs, sell-offs, spin-offs, and other divestitures, have a tendency towards a downward EM to increase the probability of completing the whole process of restructuring during a reasonable period. The application of EM manipulation activities is not only in the year of the restructuring but also for a few years before the restructuring and continue after the restructuring year. Hence, our first hypothesis, which states that firms that engage in corporate and restructuring exhibit evidence of accrual-based and real EM activities, is met based on the findings that we present in Appendix 8.

We report the univariate test for the two groups that we have classified based on the EM proxy that we calculated using the Jones' (1991) model and Roychowdhury (2006) (please refer to Appendix 9). In H2, the research intended to study the factors associated with the effect on the post-restructuring performance. We classify the sample into two groups based on the industry-year medians, since the means of our sample show that

most of the parent targets manage their earnings downward pre-announcement, during the year of the announcement, and continue even after the announcement. We classify into (1) parent targets that manage earnings below the industry year median EM index (hereafter BEM) and being coded as 0 and, (2) parent targets that manage earnings above the industry year median EM index (hereafter AEM) and being coded as 1[11]. We believe that different industries have different normal practices, and by taking the industry year median EM index, we reduce the biases by comparing targets in different industries and years.

We show the changes in the ROA post- and pre-restructuring events. We compare the mean and median of the changes in return on assets (ΔROA) in the years immediately preceding the carve-outs, sell-offs, spin-offs, and other divestitures, where ΔROA is defined as the average difference in income before extraordinary items, divided by beginning of period total assets for post- and pre-restructuring.

We use the EM proxy of year t-1 as the base for our analysis. Based on the means of EM proxy, the firms engage in carve-outs, sell-offs, spin-offs, and other divestitures manage earnings prior to the year of carve-outs, sell-offs, spin-offs, and other divestitures, and continue to manage earnings following the announcement year.

There is a significant difference between the two groups of targets that manage their earnings for sell-offs: there is no significant finding for other types of restructuring. The changes in ROA is more for firms that manage their earnings AEM index. This finding implies that firms having an EM index more than the industry year index have more changes in ROA. From a business perspective, this implies that targets that engage in sell-off types of restructuring could have a greater tendency of managing their earnings high and have more increment in their operating performance.

[11] To retain the number of samples used in this study, we consider the AEM and BEM as the two extreme practices of EM groups. Other studies use the extreme quartile of the accrual-based and real earnings management index (see e.g., Teoh *et al.*, 1998a; Teoh *et al.*, 1998b; He, 2016) or extreme deciles (see e.g. Cotten, 2005).

This is very important evidence as the good performance of targets that are involved in sell-offs could be due to the EM activities and not really the positive outcomes of the restructuring. This implies that there is a need for us to examine the impact of the EM on the changes in operating performance in more detail. Considering the 'total' impact of EM for both accrual-based and real EM activities on the changes in performance does not serve justice here. We extend our analysis to examine the determinants of EM activities for both firms, i.e., AEM and BEM in our regression estimation, and the effect of the changes in the operating performance. We will discuss the analysis that corresponds with the findings to support H2 in a later section in detail.

We use the other proxy for firm performance, i.e., CARs. We present the univariate test between the EM activities and the stock performance of the targets (please refer to Appendix 12). We measure the stock performance using the CARs. There is a consistent result between the changes in ROA and CARs results, but with different samples. The pattern is almost the same, where the firms that manage earnings AEM index have more CARs using the market model for the event window (-2, 0). We find negative and significant results for carve-out and divestiture, but not the other types of restructuring.

Using CARs as the proxy for stock performance is very challenging as it only measures the stock performance for a short period. To cater for this issue, we use the BHARs to examine stock for long-term performance. We show the Buy-and-Hold Returns (BHRs) as well as the BHARs of two groups, i.e., AEM and BEM (please refer to Appendix 13). We only find negative and significant results for carve-outs, and positive and significant for spin-offs; nothing was found for the remaining two groups. From an economics point of view, we can say that the firms having BEM have more BHRs and BHARs for carve-outs. However, the results are opposite for spin-offs as firms having AEM earn more BHRs and BHARs.

As we can see from the univariate analysis, generally the firms that manage earnings BEM index have more changes in ROA and CARs. According to Teoh *et al.* (1998b), previous EM literature documented that post-restructuring stock return underperformance of parent targets is accompanied by unusually poor earnings performance.

The initial analysis of our univariate analysis shows that there are active EM activities in the year prior to restructuring announcements, the year of announcement, and the engagement continues even after the announcements. As the median EM proxies show negative and significant for all our samples for discretionary accruals, and positive and significant results for abnormal production costs, we analyse the samples into AEM and BEM.

The tendency of management to be optimistically reporting bias earning decreases with the extent to which net assets are already being overstated on the balance sheet in the previous period (Barton and Simko, 2002). This could be the reason in our time-series EM index that all four of our samples show negative figures, as normally divestiture or restructuring announcements could be a sequence event of other events prior to the announcements.

Barton and Simko (2002) document a positive and significant relationship between the three-day CARs around the earnings surprises. Brown (2001) and Matsumoto (2002) also reported that the frequency of firms meeting or beating the analysts' forecast targets are increasing from year to year. These findings are consistent with our initial analysis that the firms that manage earnings AEM index have more tendency of earning more CARs. From an economics point of view, we can suggest that the motive to engage in EM activities is clear to firms that are involved in restructuring. The engagement in EM activities is intended to stabilize the stock prices as the consequences of failing to do would be costly to the firms.

Before we answer H2, we test for the factors that could explain the differences or tendencies behind why such firms choose to manage their earnings AEM index, and the impact of the choices on the changes in operating performance. The next section will explain the analysis from the regression.

3.4.2 Cross-Sectional Determinants EM Strategies for Restructuring Firms

Table 3.1 reports that firms engaging in corporate restructuring have abnormal accruals and real earnings management activities. We interpret that firms engaging in corporate restructuring tend to engage in both accrual-based and real earnings management activities. We present the results for HSM for the carve-out sample in Table 3.1. In Table

3.1, Columns 2, 4, 6, 8 and 10, we present the first stage of the HSM for carve-out samples, and only the *Leverage* coefficient is negative and significant at the 10% level. The dependent variable is 1 for firms that manage their earnings AEM, and 0 for firms that manage earnings BEM. The coefficient of *Leverage* is negatively significant at the 10% level; this finding implies that the firms that manage earnings aggressively AEM have the tendency to have a low leverage ratio. In economics, this implies that there is a possible motive of the firms to choose to aggressively manage their earnings as the financial condition of the firms are riskier and probably using more debts to finance their assets.

Table 3.1: Results from Heckman Selection Model of Multiple Regression of Changes in ROAs, CARs, BHARs and SDARs for Carve-out

	ΔROA		**CARs (-2,0)**		**CARs (-1, +1)**		**BHAR (+1, +12)**		**Post-SDARs**	
	EM	ΔROA	EM	CARs (-2,0)	EM	CARs (-1, +1)	EM	BHAR (+1 ,+12)	EM	Post-SDARs
TOTAL EM		-1.492*		-0.434*		-0.445*		-3.067*		-0.432*
ROA	-0.018		0.005		0.005		0.005		0.005	
SOX		-0.061		0.006		0.004		-0.060		-0.034**
OPTION	0.021	-0.005*	0.026	0.001	0.026	0.001	0.026	-0.002	0.026	0.002*
BONUS	-0.426		-0.478		-0.478		-0.479		-0.476	
SHARES	0.197	0.163*	0.079	-0.025	0.079	-0.033	0.080	0.155	0.081	0.0623**
MKT_CAP	-0.309	-0.137	-0.145	0.021	-0.145	0.029	-0.144	0.078	-0.145	-0.116***
BM	0.488	0.027	0.333	0.006	0.333	0.010	0.334	0.156	0.337	0.004
HAB_BEAT	0.000	-0.005	-0.027	-0.006	-0.027	-0.003	-0.027	0.000	-0.026	0.000
ANALYST	0.155	-0.001	0.040	0.011	0.040	0.023	0.037	-0.263	0.038	0.023
LEVERAGE	-0.576	0.276**	-0.823*	-0.123**	-0.823*	-0.124**	-0.817*	-0.043	-0.814*	-0.141***
INDUSTRY CONC		15.94*		0.356		0.378		-6.179		-0.184
INDUSTRY LEVERAGE		0.092		0.011		0.012		0.225		-0.006
INDUSTRY ROA		0.317***		0.008		-0.002		0.234**		0.006
IMDUSTRY MB		0.000		0.000		0.000		0.000		0.000
IMR		0.703*		0.221*		0.231*		1.552*		0.216*
Constant	1.961**	1.489*	1.908***	0.386	1.908***	0.366	1.901***	2.326	1.896***	0.871***
Observation	354	354	421	421	421	421	420	420	420	420
Chi-squared	8.940	74.090	9.240	18.160	9.240	19.78	9.170	24.560	9.170	50.84
Prob > chi-squared	0.443	0.000	0.416	0.578	0.416	0.472	0.422	0.219	0.422	0.000
Pseudo R-squared	0.047		0.038		0.038		0.038		0.038	

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Notes to Table 3.1: This table presents the results of two-stage Heckman Selection Model. It reports the cross-sectional maximum likelihood regressions. In columns 2, 4, 6, 8 and 10, the dependent variable (Total EM) takes the value of 1 if the earnings management proxy, i.e. discretionary accruals calculated based on Jones' (1991) Model in year t-1, and/or the aggregate proxies of real earnings management are below the industry year median, and 0 otherwise; these are calculated following Cohen and Zarowin (2010). In column 3 the dependent variable is the average change in return on assets (ΔROA) calculated as the average change in the difference in ROA after and before the restructuring year (t=0). ROA is return on assets and is defined as income before extraordinary items, divided by beginning of period total assets; SOX is a dummy variable taking the value of 1 if the observation is after 2002; OPTION represents the Black-Scholes value of option compensation as a proportion of total compensation received by the CEO and the CFO of a firm; BONUS is the average bonus compensation as a proportion of total compensation received by the CEO and the CFO of a firm; SHARES is the weighted average number of common shares outstanding at the beginning of the year, prior to the restructuring; MKT_CAP is market value of equity and is calculated as the closing price at fiscal year-end multiplied by the number of shares outstanding at fiscal year end; B_M is the book-to-market ratio, where the book value of common equity is divided by market value of equity; HAB_BEAT is the frequency of meeting/beating analysts' earnings forecasts in the past four quarters of the announcement; ANALYST is the number of analysts following the firm; LEVERAGE is the sum of short- and long-term debt divided by average total assets; INDUSTRY CONC is the sum of the largest four sales divided by the sum of sales in a given industry; INDUSTRY LEVERAGE is the average leverage ratio in the firms industry; INDUSTRY ROA is the average return on assets; INDUSTRY M_B is the average market-to-book in the firms industry; IMR is the inverse mills ratio calculated from the Probit regression in the first-stage of Heckman Selection Regression.

Source: Compiled by author from data obtained from Compustat and Thomson One Database

Columns 2, 4, 6, 8, and 10 of Table 3.2 show the first regression results of the sell-offs sample in our study. We find positive and significant for coefficient of *Hab_Beat* is positive and significant at the 5% level for the sell-offs. We interpret that firms that choose to manage their earnings AEM have the tendency to beat the analyst forecast. We also find positive and significant at the 1% and 5% levels for the coefficient of *Leverage*. The coefficients of *B_M* and *Analyst* are positive and significant at 1% and 5% respectively.

Table 3.2: Results from Heckman Selection Model of Multiple Regression of Changes in ROAs, CARs, BHARs and SDARs for Sell-off

	ΔROA		**CARs (-2,0)**		**CARs (-1,+1)**		**BHAR (+1,+12)**		**Post-SDARs**	
	EM	ΔROA	EM	CARs (-2,0)	EM	CARs (-1,+1)	EM	BHAR (+1,+12)	EM	Post-SDARs
TOTAL EM		0.486		-0.026		0.035		0.082		-0.020
ROA	-0.066		0.000		0.000		0.000		0.000	
SOX		0.027		0.001		0.006		-0.007		-0.007*
OPTION	0.008	-0.001	0.007	0.000	0.007	0.000	0.007	-0.003	0.004	0.000
BONUS	-0.508		-0.259		-0.259		-0.284		-0.151	
SHARES	-0.095	0.105	-0.161	-0.031***	-0.161	-0.037***	-0.164	-0.040	-0.215	0.040***
MKT_CAP	-0.100	-0.0979*	-0.041	0.037***	-0.041	0.040***	-0.039	0.121***	0.018	-0.073***
BM	0.089	-0.112***	0.598***	0.006	0.598***	-0.006	0.596***	0.008	0.161	0.000
HAB_BEAT	0.076**	-0.014	0.103**	0.001	0.103**	0.000	0.101**	-0.006	0.054	0.003**

ANALYST	0.294	0.051	0.197	-0.019**	0.197	-0.011	0.199	-0.140**	0.392**	0.040***
LEVERAGE	0.923***	-0.132	0.184	-0.009	0.184	-0.015	0.180	-0.193***	0.576**	-0.029**
INDUSTRY CONC		-1.717		0.062		-0.145		4.006*		-0.336
INDUSTRY LEVERAGE		0.024		0.000		0.010*		0.071*		0.016***
INDUSTRY ROA		0.075		0.022***		0.021***		0.014		0.005
IMDUSTRY MB		0.000		0.000		0.000		0.000		0.000
IMR		-0.240		0.019		-0.013		-0.024		0.009
Constant	1.412***	-0.274	1.433***	-0.034	1.433***	-0.092	1.439***	-0.343	1.227***	0.292***
Observation	1,677	1,677	1,077	1,077	1,077	1,077	1,067	1,067	1,882	1,882
Chi- squared	17.170	30.590	22.130	88.86	22.130	103.280	21.790	82.890	21.79	49.240
Prob > chi-squared	0.046	0.061	0.009	0.000	0.009	0.000	0.010	0.000	0.010	0.000
Pseudo R-squared	0.021		0.048		0.048		0.048		0.048	

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Notes to Table 3.2: This table presents the results of two-stage Heckman Selection Model. It reports the cross-sectional maximum likelihood regressions. In columns 2, 4, 6, 8 and 10, the dependent variable (Total EM) takes the value of 1 if the earnings management proxy, i.e. discretionary accruals calculated based on Jones' (1991) Model in year t-1, and/or the aggregate proxies of real earnings management are below the industry year median, and 0 otherwise; these are calculated following Cohen and Zarowin (2010). In column 3 the dependent variable is the average change in return on assets (ΔROA) calculated as the average change in the difference in ROA after and before the restructuring year (t=0). ROA is return on assets and is defined as income before extraordinary items, divided by beginning of period total assets; SOX is a dummy variable taking the value of 1 if the observation is after 2002; OPTION represents the Black-Scholes value of option compensation as a proportion of total compensation received by the CEO and the CFO of a firm; BONUS is the average bonus compensation as a proportion of total compensation received by the CEO and the CFO of a firm; SHARES is the weighted average number of common shares outstanding at the beginning of the year, prior to the restructuring; MKT_CAP is market value of equity and is calculated as the closing price at fiscal year-end multiplied by the number of shares outstanding at fiscal year end; B_M is the book-to-market ratio, where the book value of common equity is divided by market value of equity; HAB_BEAT is the frequency of meeting/beating analysts' earnings forecasts in the past four quarters of the announcement; ANALYST is the number of analysts following the firm; LEVERAGE is the sum of short- and long-term debt divided by average total assets; INDUSTRY CONC is the sum of the largest four sales divided by the sum of sales in a given industry; INDUSTRY LEVERAGE is the average leverage ratio in the firms industry; INDUSTRY ROA is the average return on assets; INDUSTRY M_B is the average market-to-book in the firms industry; IMR is the inverse mills ratio calculated from the Probit regression in the first-stage of Heckman Selection Regression.

Source: Compiled by author from data obtained from Compustat and Thomson One Database

Columns 2, 4, 6, 8, and 10 of Tables 3.3 and 3.4 show the first regression results of the spin-offs and divestiture respectively. We do not get any significant coefficient for all the independent variables. Most of the variables are not in the regression due to a multicollinearity issue for the spin-offs sample.

Table 3.3: Results from Heckman Selection Model of Multiple Regression of Changes in ROAs, CARs, BHARs and SDARs for Spin-off

	ΔROA		**CARs (-2,0)**		**CARs (-1,+1)**		**BHAR (+1,+12)**		**Post-SDARs**	
	EM	ΔROA	EM	CARs (-2,0)	EM	CARs (-1,+1)	EM	BHAR (+1,+12)	EM	Post-SDARs
TOTAL EM		-1.310		0.463		-0.185		0.767		0.192
ROA	0.012		0.013		0.013		0.013		0.009	
SHARES	0.803	0.308	0.140	-0.019	0.140	-0.004	0.073	-0.576	0.399	0.011
MKT_CAP	-0.644	-0.251	0.117	-0.020	0.117	0.013	0.149	0.291	-0.254	-0.031
HAB_BEAT	0.054	0.015	0.024	-0.008	0.024	-0.005	0.024	0.036	0.006	-0.006
INDUSTRY LEVERAGE		-0.019		-0.003		-0.015		-0.012		0.001
IMDUSTRY M_B		0.002		-0.001		-0.002		-0.005		0.000
IMR		0.701		-0.249		0.105		-0.582		-0.107
Constant	1.723**	1.390	0.465	-0.288	0.465	0.156	0.463	-0.561	1.234	0.056
Observations	102	102	55	55	55	55	54	54	95	95
Chi- squared	1.180	1.97	0.810	1.440	0.81	2.73	0.66	4.10	0.26	4.84
Prob > chi-squared	0.881	0.992	0.937	0.998	0.937	0.974	0.956	0.905	0.992	0.848
Pseudo R-squared	0.015		0.018		0.018		0.015		0.003	

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Notes to Table 3.3: This table presents the results of two-stage Heckman Selection Model. It reports the cross-sectional maximum likelihood regressions. In column 2,4,6, 8 and 10 the dependent variable (Total EM) takes the value of 1 if the earnings management proxy i.e discretionary accruals calculated based on Jones (1991) Model in year t-1 and/ or the aggregate proxies of real earnings management are below the industry-year median and 0 otherwise calculated following Cohen and Zarowin (2010). In columns 3 the dependent variable is the average change in return on assets (ΔROA) calculated as the average change in the different in ROA after and before the restructuring year (t=0). ROA is return on assets and is defined as income before extraordinary items divided by beginning of period total assets; SHARES is the weighted average number of common shares outstanding at the beginning of the year, prior to the restructuring; MKT_CAP is market value of equity and is calculated as the closing price at fiscal year-end times the number of shares outstanding at fiscal year-end; HAB_BEAT is the frequency of meeting/beating analysts' earnings forecasts in the past four quarters of the announcement; INDUSTRY LEVERAGE is the average leverage ratio in the firms industry; INDUSTRY M_B is the average market-to-book in the firms industry; IMR is the inverse mills ratio calculated from the Probit regression in the first-stage of Heckman Selection Regression

Source: Compiled by author from data obtained from Compustat and Thomson One Database

The second stage model explains the association between the EM activities patterns and the firms' performance and stock volatility. We begin our discussion with the post-restructuring performance.

3.4.3 EM Activities and Post-Restructuring Performance – Changes in ROA

The main variable for the second regression is the *TOTAL EM* and changes in ROA. We investigate the association between the EM activities of the parent targets and the

changes in ROA after and before the announcement. Our H2 predicts that the post-restructuring performance of restructuring firms is associated with the factors that contribute to the choices made by the firms to managing their earnings. We run the second stage regression following the HSM procedure to analyse the association between the *TOTAL EM* and changes in ROA.

In column 3 of Tables 3.1, 3.2, 3.3 and 3.4 we present the multivariate regression results for the changes in *ROA* for carve-outs, sell-offs, spin-offs, and other divestitures respectively. The dependent variable is the changes in ROA. *TOTAL EM*is our measure of whether a firm is classified as an EM firm year (hereafter EMF) observation or not. It takes the value of 1 if either the discretionary accruals calculated based on Jones' (1991) Model in year t-1, and/or the aggregate proxies of real earnings management are above the industry year median, and 0 otherwise, calculated following Cohen and Zarowin (2010). We find negative and significant at the 10% level results for the coefficient of *TOTAL EM*.

Table 3.4: Results from Heckman Selection Model of Multiple Regression of Changes in ROAs, CARs, BHARs and SDARs for Divestiture

	ΔROA		**CARs (-2,0)**		**CARs (-1, +1)**		**BHAR (+1, +12)**		**Post-SDARs**	
	EM	ΔROA	EM	CARs (-2,0)	EM	CARs (-1, +1)	EM	BHAR (+1, +12)	EM	Post-SDARs
TOTAL EM		0.249		-0.579**		-0.619**		-0.754		-0.125
ROA	-0.001		-0.001		-0.001		-0.001		-0.001	
SOX		-0.046***		-0.005		0.001		-0.092		-0.006
OPTION	-0.024	0.012*	-0.071	-0.008	-0.071	-0.005	-0.069	-0.046*	-0.009	0.004
BONUS	-0.148		-0.141		-0.141		-0.162		-0.054	
SHARES	-0.585	0.098**	0.636	-0.036	0.636	-0.033	0.633	0.011	-0.485	0.052**
MKT_CAP	0.263	-0.038	-0.294	0.047	-0.294	0.044	-0.295	0.128	0.236	-0.066***
B_M	-0.067	0.040*	-0.478	-0.014	-0.478	-0.018	-0.477	-0.018	-0.194	0.003
HAB_BEAT	-0.046	-0.002	0.027	0.000	0.027	-0.001	0.028	-0.017	-0.045	0.004
ANALYST	0.371	-0.069*	-0.600	-0.047	-0.600	-0.046	-0.601	-0.235*	0.145	-0.014

LEVERAGE	0.625	-0.095**	0.040	0.014	0.040	0.036	0.035	0.086	0.600	-0.035*
INDUSTRY CONC		-0.811		-0.231		-0.330		-2.266		-0.316
INDUSTRY LEVERAGE		-0.017		0.004		0.023		-0.004		0.016
INDUSTRY ROA		0.097***		-0.012		0.001		0.007		0.017*
INDUSTRY M_B		0.000		-0.003		-0.002		0.003		0.000
IMR		-0.138		0.241**		0.254**		0.269		0.072
Constant	1.381**	-0.192	2.172**	0.529**	2.172**	0.551**	2.181**	0.580	1.560***	0.385**
Observation	396	396	301	301	301	301	300	300	451	451
Chi-squared	4.800	64.48	3.840	17.51	3.84	15.81	3.81	16.640	4.960	65.56
Prob > chi-squared	0.851	0.000	0.922	0.619	0.922	0.728	0.923	0.676	0.838	0.000
Pseudo R-squared	0.021		0.034		0.034		0.034		0.021	

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Notes to Table 3.4: This table presents the results of two-stage Heckman Selection Model. It reports the cross-sectional maximum likelihood regressions. In column 2,4,6, 8 and 10 the dependent variable (Total EM) takes the value of 1 if the earnings management proxy i.e., discretionary accruals calculated based on Jones (1991) Model in year t-1 and/ or the aggregate proxies of real earnings management are below the industry-year median and 0 otherwise calculated following Cohen and Zarowin (2010). In columns 3 the dependent variable is the average change in return on assets (ΔROA) calculated as the average change in the different in ROA after and before the restructuring year (t=0). ROA is return on assets and is defined as income before extraordinary items divided by beginning of period total assets; SOX is a dummy variable taking the value of 1 if the observation is after 2002; OPTION represents the Black-Scholes value of option compensation as a proportion of total compensation received by the CEO and the CFO of a firm; BONUS is the average bonus compensation as a proportion of total compensation received by the CEO and the CFO of a firm; SHARES is the weighted average number of common shares outstanding at the beginning of the year, prior to the restructuring; MKT_CAP is market value of equity and is calculated as the closing price at fiscal year-end multiplied by the number of shares outstanding at fiscal year end; B_M is the book-to-market ratio, where the book value of common equity is divided by market value of equity; HAB_BEAT is the frequency of meeting/beating analysts' earnings forecasts in the past four quarters of the announcement; ANALYST is the number of analysts following the firm; LEVERAGE is the sum of short- and long-term debt divided by average total assets; INDUSTRY CONC is the sum of the largest four sales divided by the sum of sales in a given industry; INDUSTRY LEVERAGE is the average leverage ratio in the firms industry; INDUSTRY ROA is the average return on assets; INDUSTRY M_B is the average market-to-book in the firms industry; IMR is the inverse mills ratio calculated from the Probit regression in the first-stage of Heckman Selection Regression.

Source: Compiled by author from data obtained from Compustat and Thomson One Database

Only the coefficients of *TOTAL EM* of the changes in *ROA* regression for carve-out have negative and significant results at the 1% significant level. We do not find any significant results for the other types of restructuring. Statistically, this implies that the firms that manage aggressively above the EM industry index in the year prior to the restructuring year have a greater tendency to have fewer or lower changes in ROA in

the year after and before the announcement. From an economics perspective, firms that engage in upwards EM activities show a tendency to have a reduction in the average changes in ROA post- and pre-restructuring. This could be due to the possibility of reversing the transactions in post-restructuring years.

Our H2 predicts that the performance of the firms that are involved in carve-outs, sell-offs, spin-offs, and other divestitures, depends on the decision taken by the management to manage their earnings. The behaviour of the managers of target parents impacts the future performance of the target parents. This finding is consistent with agency theory and prospect theory, which explain the consequences of decisions made by management before the restructuring. There is a negative relationship between the firm value and the extent of EM. Our finding is inconsistent with the justification of the application of the agency theory by Jiraporn *et al.* (2008) that there is a negative relationship between EM and agency costs. We believe that managers manage earnings by assessing the benefits and risks involved while applying accounting discretion. Moreover, the existence of agency problems makes the decision detrimental to the firm value. This can be seen from the negative relationship between the *TOTAL EM and* the changes in *ROA* from our analysis.

The coefficients of the control variables that show significant results are *OPTION, SHARE, LEVERAGE, INDUSTRY CONC, INDUSTRY ROA, MKT_CAP* and *B_M*. We find positive and significant coefficient for *SHARE, LEVERAGE, INDUSTRY CONC, INDUSTRY ROA* (carve-out) and negative and significant at the 10% level for *OPTION* (carve-out), *MKT_CAP* and *B_M* (sell-off). Given this evidence, we can interpret this finding as firms that have a greater number of outstanding shares have an increment in *ROA* in the year after the announcements for carve-outs.

Zang (2012) suggests that a higher threshold induces the need for the target firms to manage earnings to achieve their goals. A higher number of outstanding shares requires an active EM activity to make sure that the firm achieves a certain level of earnings per share (Cohen and Zarowin, 2010).

The results also confirm the importance of managerial and capital market incentives as these variables have large effects on firm performance. The leverage level of a firm is also correlated with the changes in *ROA*. High leverage could bring along strong outside

scrutiny, making it necessary for firms to use both forms of EM in order to achieve earnings targets (Anagnostopoulou and Tsekrekos, 2013). At the industry level, literally from the results, the externalities from related industry contributes to the firm performance of restructuring firms (Aktas *et al.*, 2016) together with the decision-making behaviour of firms in certain industries (Roychowdhury, 2006). The industry characteristics affect firms' conduct, strategy (Kolev, 2016) and the security of potential earnings (Yalçın, 2010) in which they operate. Industry profitability and performance will influence firm diversification and consequently, firm performance as profitable industry impacts the opportunities available in the market context (Berry, 2010). The coefficient of *B_M* shows negative and significant at the 10% level; this could imply that the parent target is still undervalued event after the restructuring. This could justify why firms could have subsequent events even after restructuring.

We have discussed the association of the changes in ROA and the EM activities among firms that involved in carve-outs, sell-offs, spin-offs, and other divestitures. Next, we extend our analysis to examine the relationship between the $TOTAL\ EM$ and the *CARs*.

3.4.4 EM Activities and Post-Restructuring Stock Performance – CARs- Target Abnormal Returns

We define abnormal returns as market-adjusted returns, using the return on the CRSP value-weighted market index as the market return. Columns 5, and 7 of Tables 3.1, 3.2, 3.3 and 3.4 represent the regression results for *TOTAL EM and CARs* for window event (-2,0) and (-1, +1). The dependent variable for the multiple regression is the *CARs* for the event window (-2, 0) and (-1, +1), where 0 is the year of the announcement. We document the univariate analysis between firms that manage their earnings AEM index and BEM in the earlier section. The *CARs* of the firms that engage in EM activities AEM index have more CARs compared with firms that have BEM index. However, univariate comparisons could be misleading, as the results do not take into consideration any joints or other effects. We run the second-stage of HSM regression to examine the factors that could explain the differences in the *CARs* of both groups.

Nevertheless, our multivariate regression results show that there is a negative association between the *TOTAL EM* and *CARs*. The coefficients of *TOTAL EM* for carve-

outs and divestitures show negative and significant at the 10% and 1% level respectively. This finding supports the second hypothesis that the post- restructuring performance of firms is associated with the choices made by the firms with regard to managing their earnings. Empirically, our results show that target firms with higher level of earnings management activities i.e., above the median market EM index are associated with significantly lower CARs. Our empirical findings are consistent with the findings by Anilowski *et al.* (2009) where they find that target firms with higher levels of discretionary accruals are associated with significantly lower *CARs.* Our result indicates that the market does appear to penalize firms for the use of EM. There is a possible indication of the ability of investors to see through EM activities.

We do not find any significant results except for the sell-off and spin-off samples. Statistically, firms having AEM experience negative *CARs* around the announcement days. EM activities are not the only factor that contributes to the differences in *CARs*. Prior studies document positive *CARs* for parent firms when asset sell-offs are announced (e.g., Alexander *et al.*, 1984; Jain, 1985; Hite *et al.*, 1987; Lang *et al.*, 1995). As shown in our prediction, based on the agency costs and prospect hypothesis, managers make their own best judgement based on personal benefits, restructuring events, and the costs of engaging in EM activities.

The coefficient for control variables that are negative and significant are *Leverage* (carve-outs and divestitures), *Shares* and *Analyst* (sell-outs). The coefficient for *MKT_CAP, INDUSTRY LEVERAGE*, and *INDUSTRY ROA* are positive and significant (sell-outs). The industry control variable is consistent with the previous studies that have a negative association with *CARs* (Slovin *et al.*, 1995; Krishnaswami and Subramaniam, 1999). We discuss the analysis of EM and BHARs in the following section.

3.4.5 EM Activities and Long-Term Post-Restructuring Stock Performance – BHARs Target Buy-and-Hold Abnormal Returns

Column 9 of Tables 3.1, 3.2, 3.3, and 3.4 show the multivariate regression for BHARs for carve-out, sell-off, spin-off and other divestitures respectively. The dependent variable that we use in the second-stage HSM is the BHARs of the target firms for event window (0, +12). The coefficient for BHARs is negative and significant at the 10% significant level

for carve-outs. We do not find any significant results for the BHARs coefficient for other types of restructuring.

The empirical finding from our analysis shows that there is an association between EM activities a year before restructuring announcements and post-restructuring underperformance of targets that are involved in carve-outs. The results support our H2 that the post-restructuring performance is related to the extent of a year income-increasing EM activities by targets. Our finding is consistent with Yang *et al.* (2016) and Balatbat and Lim (2003), who claim that aggressive EM groups perform worse than the conservative EM groups for firms engaging in SEO. Balatbat and Lim (2003) find that BHARs of firms that manage earnings using accrual-based EM activity consistently perform poorly 1-3 years after carve-outs. Furthermore, BHARs of units are weaker for units that were carved out of distressed parents to improve their financial condition (Madura and Nixon, 2002). The engagement in EM activities could be the reason for managers trying to manipulate financial statements to conceal distressed conditions. Our findings indicate that managers manage the earnings of the carve-out firm upwards to influence initial offer price. However, we conclude that more investigation is necessary to understand the incentives of the parent firms in doing so. From an economics perspective, firms that manage earnings AEM index have performed poorly compared with firms that manage earnings BEM index. We extend our analysis by analysing the impact of EM activities with firms' risks. We discuss the analysis of EM and SDARs in the following section.

3.4.6 EM Activities and Stock Volatility – SDARs

Column 11 of Tables 3.1, 3.2, 3.3, and 3.4 report the results of the multivariate regression between standard deviation of monthly stock returns (S*DARs)* and *TOTAL EM.* The coefficient of *TOTAL EM* is negative and significant at a 10% level for carve-outs. We do not find any significant results for other types of restructuring for the *TOTAL EM.*

The increase in risk following restructuring is generally higher for carve-outs than for asset sell-offs; this is because parents have great control over the decisions when it comes to restructuring (Madura and Murdock, 2012). Our empirical results show that firms involved in EM activities AEM index, experience a reduction in risk following a

restructuring year. Jiraporn *et al.* (2008) suggest that firms with high levels of EM index suffer fewer agency costs. Furthermore, stock price volatility is associated with the level of information asymmetry (Cyert *et al.*, 1997). Our finding is consistent with these two previous findings. However, there is a need for us to examine the accrual-based and real EM activities separately; this is because managers may engage in real EM to meet benchmarks in an effort to maintain reputation as a way to signal superior future earnings (Gunny, 2010). Moreover, most of the motivations for EM are aimed at avoiding a decline in share price (Campa and Hajbaba, 2016). In our initial analysis, we consider both the accrual-based and real EM activities as one joint variable. We will provide a discussion in the robustness check section when we discuss the analysis taking both types of EM activities separately.

OPTION and *SHARES* can encourage risk-taking behaviour because increases in stock return volatility increase the value of the options (Haugen and Senbet, 1981; Smith and Stulz, 1985; Cyert *et al.*, 1997). Our results show that there is a positive association between the *SDARs*, *Option* and *Shares.*

A previous study suggests that the finding on the *SDARs* is very important because it might at least partly capture cash flow risk (Harford *et al.*, 2014), uncertainty (Lee *et al.*, 2008), or a measure of information asymmetry (Linck *et al.*, 2008).

3.4.7 Second- Stage Model to Explain the Use of Real Accrual Versus Earnings Management

Table 3.5 shows the cross-sectional determinants of earnings management strategies in the year before the restructuring for carve-outs, sell-offs, spin-offs, and other divestitures. Column 2 of Panel A of Table 3.5 shows the first-stage of the HSM just to obtain the IMR for the control variable for the second-stage regression of the probit regression. This is to examine the determinants of the choices between the three elements of real EM activities. The first-stage of the probit regression could also explain the determinants of the EM activities among the target firms. However, we have already explained the determinants in the earlier section (Section 3.4.2).

Columns 3 and 4 of Table 3.5, show the probit regression of the probability of firms choosing to become involved in either the combination of manipulating the cash flows and discretionary expenditure, or the combination of production costs and discretionary

expenditure. The dependent variable for the probit regression in column 3 is the variable *RM_1*; this takes the value of 1 if the figure is lower than the industry year median *RM_1*, and 0 if otherwise. *RM_2* takes the value of 1 if the figure is lower than the industry year median *RM_2*, and 0 if otherwise. The coefficient of *LITIGATION* and *SOX* are negative and significant at the 5% and 10% significant level for the probit regression of *RM_1*. The coefficient of *LITIGATION* and *SOX* are also negative and significant at the 5% and 1% significant level respectively for the probit regression of *RM_2*. The variable of *SOX* is added, as following Cohen *et al.* (2008a), that during the post-SOX period, managers are more aware and try to avoid detection of accrual-based earnings management and, consequently, encouraging managers to change from AM to RM activities.

Table 3.5: Cross-sectional determinants of earnings management strategies in the year before the restructuring

Panel A Carve-Out			
	Determinants of overall earnings management activities (First stage)	Determinants of real earnings management activities (Second stage)	
		Prob (RM_1>median)	Prob (RM_2>median)
HAB_BEAT	-0.034		
SHARES	0.222		
ANALYST	-0.284		
BONUS	-1.172*		
OPTION	0.042		
ROA	-0.001		
MKT_CAP	-0.075		
B_M	-0.048		
LEVERAGE	-0.573*		
BIG8		-0.279	-0.148
AUDIT TENURE		0.129	0.054
LITIGATION		-0.258**	-0.266**
NOA		0.000	0.000
SOX		-0.260*	-0.410***
IMR		-4.265*	-1.353
Constant	1.873***	0.565*	0.517
Observations	570	516	516
Chi- squared	7.84	15.12	12.08
Prob > chi-squared	0.551	0.019	0.060
Pseudo R-squared	0.026	0.021	0.017

Panel B Sell-Off		
	Determinants of overall earnings management activities (First stage)	Determinants of real earnings management activities (Second stage)

		Prob (RM_1>median)	Prob (RM_2>median)
HAB_BEAT	0.018		
SHARES	-0.099		
ANALYST	0.335**		
BONUS	0.188		
OPTION	-0.002		
ROA	0.000		
MKT_CAP	-0.018		
B_M	0.176**		
LEVERAGE	0.474**		
BIG8		-0.032	-0.286
AUDIT TENURE		0.126**	-0.034
NOA		0.000	0.000
SOX		0.115**	-0.299***
IMR		0.521	-1.126
Constant	1.235***	-0.108	0.605***
Observations	2,674	2,323	2,323
Chi- squared	14.44	11.28	35.77
Prob > chi-squared	0.108	0.046	0.000
Pseudo R-squared	0.012	0.004	0.011

Panel C Spin-Off

	Determinants of overall earnings management activities (First stage)	Determinants of real earnings management activities (Second stage)	
		Prob (RM_1>median)	Prob (RM_2>median)
HAB_BEAT	0.060		
SHARES	1.197		
ROA	0.013		
MKT_CAP	-0.966*		
BIG8		1.010	0.518
AUDIT TENURE		0.053	0.227
NOA		0.000	0.000
IMR		-3.523	-3.398
Constant	2.193***	0.106	-0.011
Observations	141	68	68
Chi- squared	3.37	6.68	6.82
Prob > chi-squared	0.498	0.154	0.146
Pseudo R-squared	0.037	0.075	0.072

Panel D Divestiture

	Determinants of overall earnings management activities (First stage)	Determinants of real earnings management activities (Second stage)	
		Prob (RM_1>median)	Prob (RM_2>median)
HAB_BEAT	-0.024		

SHARES	-0.337		
ANALYST	-0.016		
BONUS	-0.245		
OPTION	0.026		
ROA	0.000		
MKT_CAP	0.221		
B_M	0.005		
LEVERAGE	0.635		
BIG8		0.227	0.148
AUDIT TENURE		0.187*	-0.049
LITIGATION		0.124	-0.053
NOA		-0.000*	0.000
SOX		-0.125	-0.050
IMR		1.775	-0.986
Constant	1.281***	-0.563	0.043
Observations	629	541	541
Chi- squared	4.24	9.45	1.45
Prob > chi-squared	0.895	0.150	0.963
Pseudo R-squared	0.013	0.013	0.002

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Notes to Table 3.5: This table presents the results of two-stage Heckman Selection Model. It reports the cross-sectional maximum likelihood regressions. In column 2, dependent variable (Total EM) takes the value of 1 if the earnings management proxy i.e discretionary accruals calculated based on Jones (1991) Model in year t-1 and/ or the aggregate proxies of real earnings management are below the industry-year median and 0 otherwise calculated following Cohen and Zarowin (2010). In column 3, the dependent variable takes the value of 1 if RM_1 is higher than the industry-year median and 0 otherwise. In column 4 the dependent variable takes the takes the value of 1 if RM_2 is higher than the industry-year median and 0 otherwise. HAB_BEAT is the frequency of meeting/beating analysts' earnings forecasts in the past four quarters of the announcement; SHARES is the weighted average number of common shares outstanding at the beginning of the year, prior to the restructuring; ANALYST is the number of analysts following the firm; BONUS is the average bonus compensation as a proportion of total compensation received by the CEO and the CFO of a firm; OPTION represents the Black-Scholes value of option compensation as a proportion of total compensation received by the CEO and the CFO of a firm; ROA is return on assets and is defined as income before extraordinary items divided by beginning of period total assets; MKT_CAP is market value of equity and is calculated as the closing price at fiscal year-end times the number of shares outstanding at fiscal year-end; B_M is the book-to-market ratio, where the book value of common equity is divided by market value of equity; Leverage is the sum of short term and long term debt divided by average total assets; SOX is a dummy variable taking the value of 1 if the observation is after 2002; BIG 8 is a dummy variable that equals to 1 if the firm's auditor belongs to the Big 8 auditors and 0 otherwise; AUDIT TENURE is the log of the number of years the auditor has been with the firm; LITIGATION is a dummy variable equal to 1 if a firm's SIC code is 2833-2836, 8731-8734, 7371-7379, 3570-3577, 3600-3674 and 0 otherwise; NOA is net operating assets, which is calculated as the sum of shareholders' equity less cash and marketable securities plus total debt at the beginning of the year, deflated by total sales from the previous year; SOX is a dummy variable taking the value of 1 if the observation is after 2002; IMR is the inverse mills ratio calculated from the Probit regression in the first-stage of Heckman Selection Regression.

Source: Compiled by author from data obtained from Compustat and Thomson One Database

Panel B of Table 3.5 shows the results for the sell-off sample. The coefficient for *Audit Tenure* and *SOX* are positive and significant at the 5% significant level for *RM_1* probit regression. However, we find a contradictory result for the coefficient of *SOX* for the probit regression of *RM_2*. The coefficient of *SOX* is negative and significant at the 1% significant level. This is consistent with the explanation in the earlier paragraph. We

also find the same result for the coefficient of *Audit Tenure* for the divestiture sample in Panel D of Table 3.5. From an economics perspective, this implies that the longer the audit tenure the higher the probability of the firms to engage in RM activities.

There is much more to be explored in the future to understand the pattern of the relationship and the factors that contribute to such findings.

3.4.8 Robustness Test

First, we conduct a robustness control for the existence of multicollinearity in equation 3.10. We have four samples for the study; the spin-off and divestitures sample need some modifications in terms of the variables used in the analysis as we have a multicollinearity issue. We do provide the correlation matrix to show there is no multicollinearity issue between one variable and another variable for every sample (see Appendix 10). The correlations are low to moderate, between -0.03 and 0.55 for all four samples after removing highly correlated variables. We remove variable *BONUS* and SHARES as the variable *BONUS* is highly correlated with variable *OPTION* and *SHARES* is highly correlated with variable *MRK_CAP* for the divestitures sample. Any correlation coefficient between independent variables that is greater than 0.80 may indicate a problem of multicollinearity (Gujarati & Porter, 2003). We are therefore confident that the variables that we choose in our model provide sufficient independent information and that multicollinearity is not an issue (Cohen and Cohen, 1983). We also do check the severity of multicollinearity in the regression analysis using variance inflation factor (VIF). VIF measures how much the variance of an estimated coefficient is increased because of collinearity among the independent variables in a regression. Most of the index shows less than 7; i.e. below 10 indicating low multicollinearity among independent variables in the regression (Neter, Kutner, Nachtsheim, & Wasserman, 1996) (please refer Appendix 11). All the VIFs are below 7 so that multicollinearity does not appear to be an issue. Therefore, we do not find any evidence of multicollinearity in our samples.

Using the dichotomous variables as the measure of the EM in our study leads to the selection bias and limited econometrics methods to be applied. In our previous analysis, we use the EM as the variable of 1 of the firm having either the accrual-based earnings management index, or any of the real earnings management proxies (*RM_1* or *RM_2*)

AEM index, and 0 if otherwise. For the robustness check, we replace the EM variable with the EM industry year adjusted index and run the regression for each of the proxy, i.e., accrual based EM, *RM_1* and *RM_2* separately. We apply the ordinary least squares regression (OLS) as we do not suffer with any endogeneity issues, even when we replace the continuous variables for our EM proxy. The OLS is the best method to estimate the coefficient of our variables. The reason we do not have the endogeneity issue could be because the variables are already adjusted with the industry year index.

It is very misleading if we add up all the index and measure the EM activity as one single measure. Furthermore, combining the two proxies of RM will result in double counting (Roychowdhury, 2006; Cohen and Zarowin, 2010). We analyse each proxy separately with all the dependent variables (please refer to Appendix 14,15,16, and 17). The findings give us a more detailed understanding of the impact of the EM activity on the wealth effect of the firms that are involved in restructuring. We have consistent results when we run the regression with the changes in *ROA* for the carve-out sample. The coefficient is negative and significant at the 10% level. This implies that firms that have a lower EM index have a higher tendency towards having more average changes in *ROA*.

What is more interesting is the finding with the EM proxy *RM_2* where we find the opposite for the sell-off and divestiture samples. The coefficient is positive and significant at 1% and 10% respectively. This implies that firms that have a high index of *RM_2* have a higher tendency of having more increments in *ROA*. The coefficient of accrual-based EM for the spin-off sample is negative and significant at the 10% level. From an economics perspective, we can interpret this as firms that manage their earnings upward using accrual-based EM activity have a greater tendency of having increments in *ROA*.

The OLS for the dependent variable *CARs* shows a consistent result for the divestiture sample and the coefficient is however very small. What is interesting to know is that the coefficient for the accrual-based EM proxy is significant for carve-out and divestiture. From an economics perspective, we suggest that different types of restructuring show different patterns of managing earnings.

We do not find any significant results in the previous analysis when we test the association between the *TOTAL EM* and the *BHARs* of firms that are involved in restructuring, except for carve-outs. For a robustness check, we run the OLS with the EM index separately. We find that the coefficient of the EM index for *RM_2* is significant at the 10% level. For economics, this implies that firms that have a higher industry year adjusted EM index have a greater tendency of having positive *BHARs* (+1, +12).

The sell-off sample has the same pattern as the carve-out; this is because the coefficient of RM_1 is positive and significant at the 1% level. We do not find any significant result for the divestiture sample. However, our findings for the spin-off is opposite as we find the coefficients of *RM_1* and *RM_2* are negative and significant at the 1% level. Thus, firms that are involved in spin-off restructuring, that manage their earnings upwards using real EM activity, have a greater tendency of having more *BHARs*. From an economics perspective, the firms eventually suffer wealth reduction.

Our final dependent variable is *SDARs* as we use this proxy to evaluate the stock volatility of firms that are involved in restructuring. We find different patterns when we replace the EM proxy with the index instead of the dummy variable. We do not find any significant result for the carve-out sample. We find positive and significant results for the sell-off and divestiture samples. However, the coefficient of accrual-based EM for the spin-off sample shows negative and significant at the 10% level. From an economics perspective, firms that are involved in restructuring that manage their earnings upwards will have a greater volatility of stock prices. This implies that the firms are riskier post-restructuring.

3.5 Conclusions

Previous research has addressed the question of EM around other types of restructuring, i.e., M&A, IPO and SEO. This is the first paper to investigate restructuring types such as carve-outs, sell-offs, spin-offs, and other divestitures using accrual-based and real EM activities. We use accrual-based EM and real EM, and we use the cross-sectional Jones' (1991) model (e.g., DeFond and Jiambalvo, 1994; Subramanyam, 1996; Balatbat and Lim, 2003; Cohen and Zarowin, 2010), as well as the model for real earnings management following Roychowdhury (2006) and Cohen and Zarowin (2010).

We have made a contribution to the literature by documenting that firms use accrual-based EM and real EM activities around a specific corporate finance event restructuring. This research contributes to the literature in various ways. First, we extend the work of Balatbat and Lim (2003) and produce evidence on the relative effects of EM around corporate restructuring regarding a firm's future performance. They find that targets that are involved in restructuring and engage in accrual-based earnings management (AM) activity have poor stock performance. We choose to examine both the changes in operating performance and stock performance. This is important in order to analyse whether the engagement of targets in EM activities lead to poor performance of targets that are involved in restructuring, even though the primary objective of restructuring is to generate cash and improve performance. We examine the effect of changes in ROA, CARs, BHARs and the volatility of the parent target companies.

Second, we add to the literature by showing that targets that engage in restructuring through carve-outs, sell-offs, spin-offs, and divestitures also engage in accrual-based and real earnings manipulation EM in the years surrounding the announcements. This study may assist regulators, auditors, and policymakers to curb EM patterns of those firms that are involved in restructuring. Managers have the tendency of switching from accruals-based earnings management (AM) and real activities manipulations (RM); policymakers, regulators, and auditors must be aware of this activity among parent targets. Our empirical findings support the fact that factors such as SOX, litigation, audit tenure and net operating assets (NOA) have significant correlation to the choice of RM over AM.

Third, we analyse the factors that affect EM activities by firms that are involved in restructuring. By examining both types of AM and RM activities, we provide the evidence of trade-off between the two types of EM. We show that firms' choices of RM versus AM activities a year prior to announcements vary predictably as a function of the firm's ability to use AM, and the cost of doing so. We follow Cohen and Zarowin (2010) and use the two-stage HSM to account for restructuring firms' differing preference of RM over AM. We find that audit tenure, SOX and litigation are correlated with RM activities. Firms with auditors that have longer audit tenure show a greater tendency to use RM activities over AM.

Lastly, we show the significance of specific items in financial statements, i.e., items correlated with accruals-based earnings management (AM) and real activities manipulations (RM) activities, instead of relying on overall earnings. For example, the level of net operating assets (NOA) reflects previous EM to some extent (Barton and Simko, 2002). A higher current NOA indicates greater RM. RM is positively related to NOA, because firms with higher NOA substitute away from AM: we provide the results in the restructuring firm context. Therefore, investors can evaluate items more precisely and in more depth. This could be useful to many interested parties, namely the investing public and regulators, as well as contributing to the EM literature on firm restructuring.

There is abundant evidence on acquirers' and targets' EM before the acquisitions, IPO and SEO. The current literature is not clear about the role of the target firms in manipulating earnings before the restructuring announcements. The deals and the methods of financing through different types of restructuring can significantly impact the wealth of a target firm's shareholders, and can serve as motivation for parent targets to manipulate their earnings. This aspect of EM in parent targets remains unexplored by the literature with regards to the EM activities and its relationship to the post-announcement performance of the targets. We identify this gap in the literature, and examine the EM activities and the post-announcement performance of parent targets.

We provide evidence that, on average, target companies manage earnings downward through accrual-based and real EM the year before the announcements, and continue after the announcements. We then classify our samples into firms that engage in EM activities that have AEM index, and firms that engage in EM activities BEM. We conducted univariate analysis for both groups of firms based on their EM index for changes in *ROA* and *CARs*, as well as *BHARs*. We find that only the sell-off sample shows significant difference in changes in *ROA* medians for both groups. We find that firms having AEM have more changes in *ROA*. This is very important evidence as the good performance of targets that are involved in sell-offs could be due to the EM activities and not really the positive outcomes of the restructuring. However, the univariate test for *CARs* shows a significant difference in means for both groups as the firms with AEM have more *CARs* than firms with BEM for carve-out and divestiture. For *BHARs*, we find mixed results. There is a significant difference in means for AEM and BEM for carve-out

and spin-off. Firms that have AEM earn more *BHARs* than firms having BEM for carve-out, but we find the opposite for the spin-off sample.

The univariate comparisons could be misleading as they do not take into consideration of any joint effects. We extend our analyses by conducting the HSM to examine the determinants of the engagement of firms that are involved in restructuring in EM activities, as well as to analyse whether the differences in means from our initial univariate test could be explained by our main dependent variables of firm performance, stock performance and stock volatility.

The differences in changes in ROA, CARs, BHARs and SDARs between AEM and BEM groups are associated with EM activities. Our empirical findings show that there is a negative association between EM activities and firm performance, and a positive association with firms' risks. We find that there is a negative relationship between the changes in ROA and the EM for carve-out. We do not find any significant coefficient of EM proxy for other samples. We believe that managers manage earnings by assessing the benefits and risks involved while applying accounting discretion. Moreover, the existence of agency problems makes the decision detrimental to the firm value.

We find the coefficients of CARs for carve-out and divestiture are negative and significant at the 10% significant level. This implies that ` This indicates that the market appears to penalize firms for the use of EM. There is a possible indication of the ability of investors to see through EM activities. We extend our analysis by analysing the impact of EM activities with BHARs. We find that there is also a negative association between EM activities and BHARs. Our result is consistent with Balatbat and Lim (2003). They find that BHARs of firms that manage earnings using accrual-based EM activity consistently perform poorly 1-3 years after carve-outs. However, we analyse both accrual-based and real EM proxies in our analysis. Our analysis is more detailed and robust. From an economics perspective, our finding implies that managers choose to engage in EM activities. Balatbat and Lim (2003) claim that firms involve in carve-outs engage in accrual-based manipulation to influence the initial offer price. The market seems to see through management engagements in EM activities regardless whether AM or RM activities and penalizes firms for the use of EM activities.

However, we find a negative and significant difference at the 10% level between the post-SDARs for the period t+1 to t+3 of BEM and AEM for the carve-outs. This suggests that firms that manage earnings AEM index have lower stock volatility as compared to firms that manage earnings BEM. From an economics viewpoint, we can interpret this finding as a reduction in agency costs following the restructuring year, even though managers engage in EM activities.

This study only analyses one event that happens at one time. There is no analysis on the subsequent events. Because the analysis of the EM activities is limited to the specific types of restructuring discussed here, the scope of the research is limited. Future studies can analyse the impact of the event, as well as determine information about the EM before the event.

Our research not only contribute to a wide range of literature on restructuring and earnings management but also provides several practical implications for regulators in monitoring firms' financial reporting that have restructured their operations and businesses, for investors in making investment decisions, and for firms in considering their restructuring their businesses.

Chapter 4

The Effects of Pay Slice and Corporate Governance on Bank's Efficiency and Risk-Taking Behaviour

4.1 Introduction

The global financial crisis that started in late 2008 led to issues of corporate financial distress, bankruptcy and resulted in many institutions including big financial institutions being rescued by the government. There is an ongoing debate whether the bankruptcy law (e.g., Chapters 11 and 7 of the US Bankruptcy Code) is efficient in rehabilitating economically efficient but financially distressed firms and liquidating economically inefficient firms (Senbet and Wang, 2012; Jory and Madura, 2010; Zhang, 2010; Faelten and Vitkova, 2014) as well as issues on government bailout practises for failures institutions in the US. We have discussed the common practise in the US on restructuring as a way of reorganizing operations and generating extra resources to resolve financial difficulty issue. Another common practice in the US, is the US government interventions and legislative fixes that can be too far more insidious corporate welfare (Ritholtz, 2009). The practice of bailing out American corporations by US government has started as early as 1970s. For example, the Penn Central Railroad in 1970 and Franklin National Bank in 1974[12]. Franklin National Bank's failure that evidence emerged of corruption and shady business practices among the bank's executives that has been bailout by the US government. Even though the bailout practices have been started in 1970s, the language and philosophy were very different from the 2008 Troubled Assets Relief Program (TARP) and there is a concern that many bailouts of 2008 and 2009 are creating moral

[12] Source: History of U.S Government Bailouts, retrieved from https://www.propublica.org/special/government-bailouts.

hazard, encouraging more reckless behaviour among executives in the future (Ritholtz, 2009).

Bank's pay structures were severely criticized in the aftermath of the global financial crisis of 2008 (Fahlenbrach and Stulz, 2010; Yu and Van Luu, 2016). Bank executives' pay was focused on achieving short-term - as opposed to long-term - targets, causing banks to take on more risk (Cheng *et al.*, 2015). Due to the complexity of businesses and recent global financial crises, there is inconsistency in the association of rewards for Chief Executive Officers (CEOs) and management with the firm's performance. To realign banks' CEO pay with shareholder interests, the US government mandate that banks receiving funds from its Troubled Asset Relief Program (TARP) should adopt shareholders' say on pay arrangements. The "say on pay" and other related governance rules was incorporated into the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank)(Huntington, 2010; Public Law, 2010). Dodd-Frank Wall Street Reform and Consumer Protection Act which was passed into law in the United States on July 21, 2010 by the President, Barack Obama (Barack, 2010) . This legislation provides wide-ranging prescriptions aimed at correcting the causes of the 2008 financial crisis. It particularly focuses on the legislations related to the markets for financial products and credit ratings agencies. It allows the Financial Stability Oversight Council (FSOC) to curb problems at ailing institutions before they infect the financial system (Mintz, 2017). FSOC exercise a threefold mandate i.e., 1) identify risks to financial stability that could arise from financial distress or failure, 2) promote market discipline by eliminating expectations that the government will shield in the event of failure, and 3) respond to emerging threat to the stability of the financial system. Dodd-Frank Act is believed to prevent the excessive risk-taking by management that led to the financial crisis. Following the passage of Dodd-Frank, investors now have access to data on CEO's and top executive's pay compared to the median pay of all their employees.

The requirement to publish CEO pay is not without controversy. The Securities and Exchange Commission (SEC) took five years to settle on an agreed set of pay ratios that companies will publish – although, there is no requirement until 2018. Companies will publish data on the compensation of the CEOs and their top four executives on an annual basis.

Research on the link between executive pay and bank performance continues to preoccupy public interest (Yu and Van Luu, 2016). Current research on pay and corporate performance tends to exclude financial companies such as banks, as they tend to be highly regulated. Our aim in this paper is to examine the link between CEO pay and bank efficiency. We specifically consider the disparity that exists between CEO's pay and that of their top five executives, and how this disparity affects the bank's efficiency and risk measures. We define pay disparity between the CEO and the top five executives following Bebchuk *et al.* (2011), i.e., the CEO pay slice (hereafter CPS). CPS is the total CEO compensation divided by the total compensation of top five executives.

Our empirical methodology includes the estimation of; (i) Ordinary Least Squares (OLS) regressions in all our CPS variables, (ii) Two- stage least squares (2SLSL) regression models in which the CPS variables are instrumented, and (iii) simultaneous equation models in which the bank efficiency/ bank risk and CPS are simultaneously estimated using an instrumental variables approach. Using OLS approach in our first methodology does not eliminates issues related to endogeneity. To control for endogeneity issues, we use 2SLS, instrumental variable (IV) methodology. A suitable instrumental variable to be used in the 2SLS estimation should have two properties; it should be related to the variable it serves as an instrument for and unrelated to the error in the model (Elyasiani & Jia, 2008). We employ Number of VPs and CFO as VP as the joint instrumental variables for CEO Pay Slice (CPS) and Industry-median Efficiency as the instrumental variable for the bank's efficiency. We also use the Industry- median figure as the instrumental variable for bank insolvency risk and stock volatility variables. Under the 2SLS, IV approach, we first estimate the regression of the endogenous variable CPS on instrumental variables and exogenous variables to obtain the predicted values of CPS. In the second stage, I run the original regression (Equation 4.6) with the endogenous variable replaced by the predicted value from the first stage regression.

This study contributes to the literature in banking and finance in several ways. Despite the public and media outcry around the pay cheques of the CEOs at the largest US financial institutions, there are very limited number of papers that examine the link between CEO pay and bank efficiency. To the best of our knowledge, the only study that directly addresses the topic is Matousek and Tzeremes (2016). The authors study the

effect of CEO compensation on bank's technical efficiency using the non-parametric Data Envelopment Analysis (DEA). Their sample comprises 37 holding banks in the US from 2003 to 2012. They find a non-linear relationship between CEO compensation and bank efficiency, which is inconsistent with the findings based on parametric approaches. They find that lower salaries exert a negative effect on bank technological innovations. According to the authors, a minimum salary level exists below which, CEO compensation is negatively related to bank performance.

Our study differs from Matousek and Tzeremes' (2016) in a few important aspects. First, we use the parametric frontier Stochastic Frontier Analysis (SFA) method. The DEA method, while it works well with limited samples, suffers from a deterministic nature and an inability to provide the statistical precision of efficiency estimates. This introduces bias (Emrouznejad *et al.*, 2010; Moradi-Motlagh and Babacan, 2015). Additionally, Matousek and Tzeremes' (2016) study is limited to 37 banks and covers the period up to 2012. Conversely, our sample includes 121 US banks and extends up to 2014. Third, unlike Matousek and Tzemeres (2016), who study the effect of CEO salary and bonus payments, our study considers the relation between the CEO Pay Slice (CPS) (i.e. the fraction of the aggregate compensation of the top-five executive team captured by the Chief Executive Officer) and the efficiency and risk of US banks. According to Bebchuk *et al.* (2011), the merits of using CPS in preference to monetary pay amounts are that CPS reflects both the relative importance of the CEO and the extent to which the CEO is able to extract rents. Fourth, given that a significant part of CEO compensation is contingent based (for instance, stock options), we examine the effects of the contingent portion of CEOs' pay separately from their total pay. Additionally, we consider the effects of the Top Management Team (TMT) compensation. Finally, we consider both the stock market risk and the insolvency risk of the sampled banks. Thus, our paper offers a rich set of interactions between the various elements of CEO pay and bank efficiency. The remainder of the paper proceeds as follows. We review the literature and develop our hypotheses in Section 2. We present our data and methods in Section 3. We present and discuss our findings in Section 4, and conclude the paper in the final section.

4.2 Literature Review and Development of Hypotheses

4.2.1 CEO Pay Slice (CPS)

A broad range of variables exist which are designed to measure the inequality between CEO and top management pay. Among them are the coefficient of variance, the Gini coefficient, the Theil index, relative mean deviation, standard deviation, and the logarithm of the pay gap. Except for standard deviation, Wei *et al.* (2015) find that the variables are closely related to each other and that interchanging them has little impact on their relation to the outcome variables.

Bebchuk *et al.* (2011), using information from the Compustat's ExecuComp database (1993 to 2004), examine the relationship between pay disparity, firm value, and performance, respectively. They define CEO pay slice (CPS) as '…the fraction of the aggregate compensation of the top-five executive team captured by the CEO' (Bebchuk *et al.*, 2011:199). They find an inverse relationship between pay disparity (i.e., higher values of CPS) and the industry-adjusted Tobin's Q. We define our pay disparity in a similar way to their terms, i.e., CEO pay slice (CPS).

Similar to Siegel and Hambrick, 2005, Pissaris *et al.*, 2010, Bebchuk *et al.*, 2011, Wales *et al.*, 2013, and Ridge *et al.*, 2014, Al-Najjar, 2015 compute pay disparity as the percentage of CEO compensation divided by the compensation package of the top-five members of the executive team. We adopt the same measure in this paper since it meets the requirement of the SEC on the publication of pay measures.

4.2.2 Bank Efficiency

Tournament theory has been widely used to explain pay disparity between CEO and the rest of the top management team (Ridge *et al.*, 2015; Lee *et al.*, 2008; Carpenter and Sanders, 2002; Lin *et al.*, 2013; Kini and Williams, 2012; Yu and Van Luu, 2016; Bebchuk *et al.*, 2011; Connelly *et al.*, 2014; Kale *et al.*, 2009; Firth *et al.*, 2015). Under tournament theory, pay disparity acts as an incentive for CEOs to work harder. The disparity leads the CEO to believe that her unique skills and inputs are highly prized and are fairly and rightly compensated (Lin *et al.*, 2013).

Conversely, Pissaris *et al.* (2010) posit that pay disparity can lead to agency conflict. Tournament theory also suggests that competition for high pay leads to top candidates

acting selfishly to preserve their own interests at the expense of the corporation's (Siegel and Hambrick, 2005). Berri and Jewell (2004) claim that inequality in pay indicates that workers at the bottom of the firm's hierarchy are competing in a tournament that is unfair since they are unable to share in the rewards of their hard labour.

Pissaris *et al.* (2010) find that the ability of pay disparity to incentivize managers to perform better, as per the tournament theory, depends on, to a large degree, the firm's governance characteristics. The authors find that among firms characterized by weaker monitoring and transparency, the predictions of tournament theory do not hold, i.e., their performance is inversely related to pay disparity.

Armstrong *et al.* (2012) analysed 2,110 proxy statement disclosures of companies from the Russell 300 Index to examine the link between corporate governance practices and CEO pay levels. Firms that are weak in corporate governance hire consultants to assist with setting executive compensation. These firms end up paying the highest CEO compensation.

Al-Najjar *et al.* (2016) studied UK listed firms' CEO pay slices (CPS) and found them to be higher at better run companies (i.e. those that score highly on corporate governance and board independence and exhibit superior operating performance). Conversely, board size and CEO duality (i.e. the CEO is also the Chairperson of the Board) adversely affect CPS. Carpenter and Sanders (2002) found that top management team compensation is directly related to a firm's Tobin's Q and return on assets only when top management team pay is aligned with shareholder interests. This alignment ensures that agency conflicts are kept to a minimum.

Ridge *et al.* (2015) define pay disparity as the difference in pay between the top four executives and the CEO. They use tournament theory and social comparison theory to explain the effects of pay disparity on firm performance. Social comparison theory suggests that the CEO exerts a significant influence in selecting members of the board who then determine the CEO's pay. Furthermore, the members are themselves current or former CEOs and use their pay as a reference point in setting CEO pay (O'Reilly *et al.*, 1988). The authors find that social comparison processes are more relevant in setting CEO compensation.

Pissaris *et al.* (2010) analyse how corporate governance and executive pay disparity affect corporate performance. They define pay disparity as "…the dollar value difference between CEO total compensation and the average value of the four most highly paid top management team". They find that pay disparity enhances firm performance.

Zhang (2014) measures pay disparity as the logarithm of the dollar difference between the CEO's overall remuneration and the median total pay of a non-CEO executive. Using Tobin's Q to measure firm performance, Zhang finds pay disparity to be inversely related to performance despite the firm having strong corporate governance variables in place.

Firth *et al.* (2015) examine relative pay in China and find wide pay differences between top management and the average worker in the firm. This pay disparity adversely affected the firm's productivity and is more pronounced in labour-intensive firms.

Pissaris *et al.* (2010) analyse how corporate governance and executive pay disparity affect corporate performance. They define pay disparity as "…the dollar value difference between CEO total compensation and the average value of the four most highly paid top management team". They find that pay disparity enhances firm performance.

Yu and Van Luu (2016) examine the applicability of the equity fairness theory –which advocates for small pay disparity and, therefore, better teamwork – in setting executive compensation. Using a hand-collected dataset of 63 banks from The Organization for Economic Co-operation and Development (OECD) countries and 29 banks from developing countries over the period 2004-2012, they found that executive-pay dispersion adversely affects bank performance (measured using the price-to-book ratio and the Tobin's Q).

Matousek and Tzeremes (2016) investigate the effect of CEO bonus and salary payments on banks' technical efficiency levels. They use DEA to estimate the efficiency and use a sample of 37 US banks for the period from 2003 to 2012. They find that salary and bonus payments are not always aligned with higher technical efficiency levels.

Tournament theory suggests that, at the firm level, executives will compete among themselves to move up the ladder until they reach the top job, i.e. becoming the firm's CEO. In this setup, the pay disparity between the CEO and the rest acts as a signal that

the company rewards human talent and skills based on individuals' contribution and performance. The pay disparity, therefore, acts as a powerful incentive for lower-level employees to compete for the top jobs. The ensuing competition should lead to a large pool of highly competitive, qualified, and skilled employees, which should improve operating performance.

However, the empirical evidence does not consistently point to improved performance. Large pay disparities could be a sign of "excessive CEO hubris" (Hayward and Hambrick, 1997). The competition can result in brilliant individual performances but not necessarily a team performance. It can also lead to a lot of internal squabbling, which affects performance negatively. Should the internal tournaments lead to managers seeking to protect their own interests at the expense of the shareholders', it will exacerbate agency conflicts. This focus on individual gains at the expense of the corporation is consistent with the rent-seeking theory, whereby top management is more interested in achieving short-term goals rather than improving the firm to ensure its long-term survival. Thus, under the rent-seeking theory, the firm efficiency is expected to decline.

H1: High pay disparity adversely affects bank efficiency

4.2.3 Bank Risk

Wide pay disparities would seem to motivate employees to perform better in order to achieve high pay. However, it is unclear how this race to the top affects a bank's operations risk-wise. Does it promote or dampen risk-taking by the top management team (TMT)? Gilley *et al.* (2002) find that TMT risk taking has a strong positive influence on firm performance.

We also examine the factors that affect this pay disparity and its relationship to bank efficiency and risk. On the subject of the determinants of CEO compensation, Core *et al.* (1999) measure board and ownership structures, and relate them to CEO compensation. They find that ineffective governance structures tend to favour high CEO pay, which subsequently affects the firm's operating and stock performances. Adhikari *et al.* (2015) find that the increase in the complexities brought about by Sarbanes-Oxley Act (SOX) of 2002 has forced CEO pay up for older and more experienced CEOs since

they are more experienced with SOX. Filbeck *et al.* (2011) analyse the impact of the Sarbanes-Oxley Act of 2002 (SOX)-related announcements on bank holding companies. SOX was enacted in response to a number of high-profile financial reporting scams (Enron and WorldCom being the prominent ones) in the USA. The authors argue that despite SOX, banks were already heavily regulated and, thus, it should be easier for them to comply with SOX compared to firms that are less regulated. They find that the stock prices of banks increased significantly around the dates of SOX-related announcements.Kini and Williams (2012) measure pay disparity as the logarithm of the difference between CEO pay and the median pay of the rest of the management team. They find that pay disparity is directly linked to both firm performance and risk, and that firms exhibit behaviour consistent with tournament theory.

However, given the scrutiny that CEOs are subject to, as well as the short-term tenure of their positions, these twin forces could force them (in their attempt to secure their pay) to adopt a risk-averse approach that would preserve the status quo. CEOs could favour short-run projects with quick returns rather than projects with slower but ultimately higher returns. Atrill (2015) argues that such myopic behaviours result from (i) the way CEO compensation are structured, which tends to promote the short- over the long-run, and (ii) the short-term management tenure and contracts. The author argues that CEOs would be keen to cut back on discretionary expenditures like R&D and advertising. The short-term focus and cuts in discretionary expenditure would affect the corporation's long-term value and consequently its stock price.

According to Kupiec and O'Brien (1997) and Matousek and Tzeremes (2016), high levels of CEO bonuses are linked with banks that overinvest in risky loans and securities, which adversely affect banks' technical efficiency.

There is a large literature that surveys how convex compensation schemes - whereby the CEO's expected wealth is an increasing function of the firm risk - have been established to tackle the aforementioned risk-related agency costs (see Cain and McKeon, 2016). They should lead to a higher preference for risk among CEOs.

The analysis by Moradi-Motlagh and Babacan (2015) reveals that the global financial crisis had an adverse effect on the efficiency of Australian banks. Le and Jaeger (2015) examines the effects of CEO compensation on risk-taking in bank industry. Using a

database on CEO compensation of 46 European and 28 North American banks for the year 2003-2007, their analysis shows that CEO bonus may induce manager to take more risk, however it has no responsibility for the increase in all types of bank risk in the period 2008-2011. Thus, we hypothesize that financial crisis measures moderate the effects of pay disparity on bank's risk and efficiency measures.

H2: High pay disparity positively affects the bank's risk

Inter-bank competition has led to banks becoming more efficient. Deregulation of branching and the repeal of the Glass-Steagall Act resulted in intense competition among banks (Beck *et al.*, 2013) and the pursuit of bank efficiency (Bertrand *et al.*, 2007). To stay competitive, banks sought to attract the top candidates by offering high pay, which further acerbated the pay disparity between CEOs and the rest of the labour force. However, size brings along diseconomies of scale, which should adversely affect efficiency. Following the 2008 financial crisis, there were numerous calls for banks to be shrunk and simplified (Tett, 2012) with some banks unaware of the actions of their traders and the risk inherent in their derivatives book.

Bank's pay structures were severely criticized in the aftermath of the global financial crisis of 2008 (Fahlenbrach and Stulz, 2010; Yu and Van Luu, 2016). Bank executives' pay was focused on achieving short-term - as opposed to long-term - targets, causing banks to take on more risk (Cheng *et al.*, 2015). Due to the complexity of businesses and recent global financial crises, there is inconsistency in the association of rewards for CEOs and management with the bank's performance and risk.

Pre-financial crisis, many of CEO or executives of big banks received large compensations, then bailed after they destroyed their banks (e.g., Lehman Brothers, Merrill Lynch, Countrywide Financial[13]). For example, Lehman Brothers Chairman and

[13] Countrywide Financial is now owned by Bank of America.

CEO Richard Fuld Jr. sold his $490 million Lehman Brothers stock in the years before Lehman filed for Chapter 11 Bankruptcy (Ritholtz, 2011).

However, Guo et al, 2015) find that bank insolvency risk measured by the Z-score have a direct relationship with both the percentages of short-term and long-term incentive compensation. They study whether executive compensation in larger banks, especially the too-big-to-fail (TBTF) banks, induces more severe moral hazard behaviour. They also find that TBTF banks experience greater insolvency risk and more likely to be in financial distress than smaller banks. However, they ignore the compensation of other top executives.

We expect that riskier banks, pay greater compensation to their CEOs as compared to others management team members to encourage aggressive risk taking leading to higher insolvency risk. CEO may have different pay structure than other top executives (Angbazo & Narayanan, 1997; Demsetz & Saidenberg, 1999). Little attention is paid to variation in compensation structure across firms or differences or pay disparity between the compensation structure of CEOs and other top executives (Demsetz & Saidenberg, 1999). Berri and Jewell (2004) claim that inequality in pay indicates that workers at the bottom of the firm's hierarchy are competing in a tournament that is unfair since they are unable to share in the rewards of their hard labour. Thus, it is plausible to test whether the rising pay disparity led to more complex banks that threatened their survival.

H3: High pay disparity is associated with higher insolvency risk

4.2.4 Bank Institutional Ownership

Fahlenbrach and Stulz (2011) consider whether bank performance during the 2007-2008 credit crisis was related to CEO incentives prior to the crisis. They find no evidence to suggest that CEOs whose incentives are aligned with shareholders' interests perform better. CEOs, whose pay is related to the bank's share price, suffered large losses in the wake of the crisis.

The Securities and Exchange Commission (SEC) introduced new requirements concerning the disclosure of information by banks in 2006; included in these were caveats on executive compensation. If their fiscal year finished on or after December 15,

2006, they were compelled to comply. The new requirements are designed to better inform investors and other stakeholders about how a bank's compensation is set. Besides disclosure, institutional ownership is another effective form of corporate monitoring. Reddy *et al.* (2015) find that CEO compensation is subject to internal forces as opposed to external ones. For instance, CEOs that also serve on their companies' board earn more suggesting that they influence the board to increase their pay. Similarly, companies that pay directors more, end up paying their CEOs more, which is consistent with the managerial entrenchment hypothesis. They find that the proportion of institutional and block shareholders is positively associated with CEO compensation but not operating performance, which puts into doubt the benefits from institutional investors' monitoring. However, the results on the association between CEO compensation and bank performance are mixed. Wand and Chen (2015) find that executive compensation is positively related to board size and the shareholdings of the biggest shareholder. Compensation is inversely related to the proportion of independent directors on the board and state ownership. They find no link between the performance of the listed Chinese commercial banks and executive compensation. The presence of influential shareholders will act as a check on the on-CEO's powers. Their presence may moderate the potential adverse effects resulting from CEO pay disparity. Conversely, these shareholders may collude with the CEO to increase pay provided that their interests are protected (see Pound, 1988). To account for their influence, we use the proportion of shares held by institutional investors, which include mutual funds, hedge funds, pension funds, banks and insurance companies. Empirical evidence suggests that they own two-third of US-listed firms (Gillan and Starks, 2000; Clay, 2002; Blume and Keim, 2012; Jafarinejad *et al.*, 2015) we hypothesize that the higher the proportion of shares held by institutional investors, the higher is the bank's efficiency despite large pay disparities.

H4: Institutional ownership is directly related to bank efficiency irrespective of pay disparity.

An emerging literature on the effects of institutional ownership on firm value suggests that in addition to the proportion of shares held by investors, it is equally

important to consider institutional ownership stability. They argue that not all institutional investors stay with a firm for the long-term. Some are short-term and would leave at the first sign of trouble. Elyasiani and Jia (2010) and Callen and Fang (2013) argue that "stable" institutional investors are more incentivized to monitor target firms and improve shareholder welfare.

Recent literature suggests that besides ownership proportion, it is equally important to consider the stability of the ownership (Gaspar *et al.*, 2005; Chen *et al.*, 2007; Yan and Zhang, 2009; Elyasiani and Jia, 2010; Jafarinejad *et al.*, 2015; Attig *et al.*, 2012; Callen and Fang, 2013). Not all institutional investors will stay with a corporation for the long-term and/or engage with the firm CEO's to protect shareholders' wealth. Many of them trade frequently and alter their shareholdings often. Others are passive investors, index trackers and have little incentive to engage in corporate governance similar to activist investors. We hypothesize that stable institutional investors are more influential in moderating the effects of pay disparity on bank efficiency.

H5: The stability of institutional investors directly is directly associated with bank efficiency.

4.3 Sample selection and data description

We obtain our sample from the Standard and Poor's Execucomp database. All firms should have a SIC code between 6000 and 6300. The sample period starts in 2000 and ends in 2014. We exclude the following firms since they are purely advisory businesses or wire-transfer agents and therefore cannot be classified as lending institutions: SIC codes 6282 (investment advisors), 6211 (pure brokerage businesses) and 6199 (wire transfer businesses). The retained banks should have compensation data in Execucomp, stock returns data in CRSP and accounting data in Bankscope and COMPUSTAT. We also downloaded data from the following sources: corporate governance G and E indices from ISS (formerly known as RiskMetrics); data related to the Troubled Asset Relief Program (TARP) from ProPublica, and institutional ownership data from the Thomson Reuters database. The definition of variables used and the source of variables are presented in Appendix 18. We provide the list of the sample in Appendix 19. The final

sample comprises 1,171 firm-year observations from 121 banks. We present the sample distribution by year in Panel A of Table 4.1.

Table 4.1: Sample Distribution

Panel A – Distribution by Year		
Year	*N*	*%*
2000	33	2.82
2001	36	3.07
2002	40	3.42
2003	41	3.50
2004	45	3.84
2005	59	5.04
2006	68	5.81
2007	77	6.58
2008	77	6.58
2009	110	9.39
2010	113	9.65
2011	117	9.99
2012	117	9.99
2013	120	10.25
2014	118	10.08
Total	1,171	100.00

Source: Compiled by author from data obtained from Bankscope

The highest number of firms sampled in this study was recorded in the year 2013 (n=120) out of 121 or in percentage terms approximately 10.25% and followed by 2014 for 118 firms. The smallest number of samples is in the year 2000 for only 33 banks and only 2.82%.

We present the summary statistics of CEO, top five, and management team compensation in Panel B of Table 4.1. We calculate pay ratio as measures of tournament incentives using data from ExecuComp. The average CEO total compensation is US$6,090.93 million, and the standard deviation is US$10,621.42 million.

Panel B: Summary Statistics of CEO, Top Five, and Management Team Compensation

Variable	Mean (USD '000)	Median (USD '000)	Std Dev (USD '000)
CEO Compensation			
-Total salary	793.00***	750.00***	460.27
-Total cash/ current compensation	1,653.52***	901.52***	2,540.97
-Total contingent compensation	5,277.03***	1,969.34***	10,529.60
-Total compensation-TDC1	6,090.93***	2,832.40***	10,621.42
Top Five Management Team			
-Total salary	2,507.97***	2,287.51***	1,358.43
-Total cash/ current compensation	5,736.90***	2,903.61***	9,651.93
-Total contingent compensation	14,843.90***	5,188.89***	26,465.19
-Total compensation-TDC1	17,351.86***	7,865.25***	26,950.41

All Management Team			
-Total salary	2,003.20***	1,742.28***	1,215.77
-Total cash/ current compensation	4,822.20***	2,165.00***	8,886.89
-Total contingent compensation	10,574.54***	3,073.39***	19,940.77
-Total compensation-TDC1	12,610.04***	5,101.00***	20,490.06

Figures are in thousands

Source: Compiled by author from data obtained from Bankscope and Execucomp

The average total asset is US$121,691.630 million, and the standard deviation is US$384,822.650 million (please refer to Appendix 22). The average return on assets (ROA) is 1.72. Large financial institutions are included; this is unsurprising as ExecuComp favours larger banks (Fahlenbrach *et al.*, 2010). All the continuous variables share the significant p-value. This indicates that all variables are not significantly equal to zero. For a better understanding of the key variables used in this study, we present the univariate test results (please refer to Appendix 23). Our initial findings can be seen from the univariate test. The *EFFICIENCY* index is higher for banks with lower than the median CPS regardless of the types of CPS. In term of the stock volatility, banks that have above the median CPS have lesser stock volatility. Banks with above the median CPS have lower insolvency risk. From these initial results, we suggest that firms that pay high CPS are less efficient but more stable than those banks that pay lower CPS. To understand the association between efficiency, risk, and CPS, we ran multivariate regressions. We discuss the methodology used in detail in the next section.

4.4 Methodology

4.4.1 CEO Pay Slice (CPS)

We follow Bebchuk *et al.* (2011)) to proxy for rent-seeking inducements. Under the rent-seeking inducement hypothesis, the CEO pay portion dominates the CPS. The rational of using CEO Pay Slice (CPS) to proxy for rent-seeking inducements is because CPS could represent the relative importance of the CEO as well as the degree to which the CEO is able to extracts rents (Bebchuk *et al.* (2011). The greater the CPS, the higher the chances of the CEO to have power and influence over the bank's decision making. Using CPS as the proxy for rent-seeking inducements, we can control for any bank-specific

characteristics that affect the average level of compensation in the bank's top executive team. Furthermore, CPS has a rich set of relations with various range of aspects of bank's performance, behaviour and has been trending up over time (Frydman, 2005; Frydman and Saks, 2010; Bebchuk *et al.* (2011)). In contrast, we use CPS with firm efficiency and behaviour of banks at any given time.

Specifically, we use the following CEO Pay Slice (CPS):

$$CPS = \frac{CEO}{Top\ five\ including\ the\ CEO} \tag{4.1}$$

We calculate the above ratio successively using four definitions of pay, i.e.:

1. Total (ExecuComp variable TDC1);
2. Salary (The dollar value of the base salary (cash and non-cash));
3. Current (Salary *plus* Bonus); and
4. Contingent (TDC1 *minus* salary and Bonus).

Categorizing pay as such allows us to consider the effects of both short- and long-term measures of compensation (also see Pissaris *et al.*, 2010). Current salary and bonus proxy for short-term incentive measures, while the contingent portion of executive compensation proxies for long-term incentive measures. TDC1 from ExecuComp includes '…salary, bonuses, other annual compensation, total value of restricted stock granted, Black and Scholes value of stock options granted, long-term incentive payouts, and all other total incentive compensation' following Bebchuk *et al.* (2011, p.9).

Thus, we end up with a 1×4 matrix of CPS. The use of these alternative measures provides some important benefits. First, they allow us to capture more than one dimension of the CEO's pay. Furthermore, since each ratio is relating the CEO's pay to the pay of other employees, they diminish the effects of firm-specific characteristics that affect the average executive remuneration.

4.4.2 Institutional Ownership

This section draws heavily on Elyasiani *et al.* (2010). To compute institutional ownership, we use two measures, i.e. the proportion of shares held by institutional investors (IOPr)

and the standard deviation of the institutional shareholding proportions (IOV). To measure IOPr and IOV, we follow Elyasiani *et al.* (2010) and compute the variable using 20 quarters (i.e., the last five years including the sample year) of data as follows:

$$IOPr_i = \frac{\sum_{t=1}^{20} \sum_{j=1}^{J_i} p_{i,t}^{j}}{20} \tag{4.2}$$

where $p_{i,t}^{j}$ is the proportion of bank i held by investor j in quarter t (t = 1, 2… 20), and J_i is the number of institutional investors in bank i.

$$IOV_i = \frac{\sum_{j=1}^{J_i} stdev(p_{i,t}^{j})}{J_i} \tag{4.3}$$

IOV is the average of the standard deviations of the quarterly IOPr across all institutional investors j in bank i. The higher IOV, the lower is the institutional ownership volatility.

4.4.3 Bank efficiency and risk

4.4.3.1 Bank Efficiency

In previous studies of the pay disparity- performance relationship, scholar commonly use reduced-form model (Yu & Van Luu, 2016). However, following Yu and Van Luu, (2016), we use translog cost function that is more suitable taking into consideration the unique nature of the banking industry i.e., the combination of labour, interest, and capital to produce banking services.

We use the Stochastic Frontier Analysis (SFA) method to compute firm efficiency (Aigner *et al.,* 1977; Kumbhakar and Lovell 2000; Bonin *et al.*, 2005). We use SFA to estimate cost functions. The use of a cost-over-profit function is motivated by the work of (Pulley and Humphrey, 1993; Berger *et al.,* 1996; Bonin *et al.*, 2005). We first estimate the minimum cost frontier for the entire sample. The efficiency measure for a specific bank is its distance or gap from the frontier. We use the following specification for the cost frontier:

$$TC_{it} = f(P_{it}, Y_{it}) + v_{it} + u_{it} \tag{4.4}$$

Where TC_{it} is the total cost for the ith bank in year t. P_{it} is a vector of input prices, and Y_{it} represents a bank's array of products and services. The term v_{it} stands for the error term, while u_{it} denotes bank inefficiency. We apply a translog specification to the cost function in (4.4) based on the standard symmetry and homogeneity assumptions as in the literature (Bonin *et al.*, 2005). Similar to Fries and Taci (2005), the translog cost function, opted in this study, takes the form;

$$\ln TC = a_0 + \sum_{n=1}^{n} \alpha_i \ln Y_i + \sum_{j=1}^{n} \beta_j \ln P_i + \frac{1}{2}\left[\sum_{i=1}^{n}\sum_{j=1}^{n} \delta_{ij} \ln Y_i \ln Y_j + \sum_{i=1}^{n}\sum_{j=1}^{n} \gamma_{ij} \ln P_i \ln P_j\right] + \sum_{i=1}^{n}\sum_{j=1}^{n} \rho_{ij} \ln Y_i \ln P_j + E_i \quad (4.5)$$

To estimate the stochastic cost efficiency frontier for banks, we use the maximum likelihood procedure of Jondrow, Lovell and Schmidt (1982) as follow:

$$\sigma_\varepsilon^2 = \sigma_u^2 + \sigma_v^2 \text{ and } \beta = \sigma_u^2/\sigma_\varepsilon^2 \quad (4.6)$$

Where, lnTC = the natural logarithm of total costs; ln Y is the natural logarithm of output quantities; ln P is the natural logarithm of input prices; E_i = V + U is as defined in equation (4.4); $\alpha, \beta, \delta, \gamma \; and \; \rho$ are coefficients to be estimated. We employ the intermediation approach following Sealey and Lindley (1977) in order to define bank inputs and outputs and assumes that banks use labour and capital in order to collect funds and transform them into loans and other earning assets. We follow this approach that is used in previous studies to estimate efficiency (Fries & Taci, 2005; Mamatzakis, Matousek, & Vu, 2015; Matousek & Tzeremes, 2016). Total cost is the sum of interest expenses and general operating expenses. For the inputs variables, we employ the price of labour and physical capital. The price of labour is measured as the ratio of personal expenses to total assets, and the price of physical capital is measured as the ratio of operating expenses to fixed assets. We use two banks output following Fries and Taci (2005). One is loans to customers and another output is deposits. Loans to customers

includes all loans to non-bank entities and loans to other banks. Deposits includes total deposits from customers and other banks. From equation 4.5, we take the efficiency scores from thus specification as dependent variable in regression to investigate the effect of CPS on bank performance. The efficiency score ranges from 0 to 1. The nearer to 1 the score is, the greater efficiency the bank achieve.

4.4.3.2 Bank Risk

We use one-year stock return volatility (SDAR) and daily stock return volatility (SDD) as analogues for bank risk. A stock volatility is the variation in its stock prices over a period of time. We use the standard deviation of daily and monthly stock returns to measure the stock return volatility. We collect both daily and monthly annual returns for each bank in the sample from year 2000 to year 2014. We retrieve stock returns from the CRSP database using the Eventus software. We calculate the standard deviation of stock returns for each bank for each year from 2000 to 2014 using both daily and monthly data. Each bank in the sample has one variable for SDAR (using monthly stock return) and one variable for SDD (using daily stock returns) for each year. Measures based on stock return standard deviation are used in volatility measures and indices traded on the market and are market-based[14].

Following Agoraki *et al.* (2011) (also see Soedarmono *et al.*, 2013) we proxy the risk-taking behaviour of banks by the Z-index defined as follows:

$$Z_{i,t} = \frac{ROA_{i,t}+EQTA_{i,t}}{SDROA_{i,t}} \quad (4.7)$$

Where $ROA_{i,t}$ is the return on assets, $EQTA_{i,t}$ is the total equity to total assets. $SDROA_{i,t}$ it is an estimate of the standard deviation of the rate of return on assets. The Z-score is directly related to a bank's default risk (Agoraki *et al.*, 2011).

[14] Previous study by Core *et al.* (1999), Low (2009), Cheng *et al.* (2015), Lee *et al.* (2008) among others, use the standard deviation of either daily stock returns or monthly stock returns as a proxy for risk or stock volatility in their study.

We present a Pearson correlation matrix among the independent variables (please refer to Appendix 20). The results indicate all the independent variables are low and moderately correlated which confirms multicollinearity is not a problem. The correlations are low to moderate, between -0.07 and 0.18. We are therefore confident that the variables provide sufficient independent information and that multicollinearity is not an issue (Cohen and Cohen, 1983). To assess for severity of multicollinearity in the regressions, we compute variance inflation factors (VIF). VIF measures the extent to which the variance of the estimated coefficients is inflated due to collinearity among independent variables in the regression. The VIFs of the estimated coefficient in the regression on *EFFICIENCY* (please refer to Appendix 21). The average VIF for the regression is 1.24, and the VIFs for individual variable range from 1.02 to 1.77, and the tolerance values range from 0.57 to 0.98. Moreover, the variance inflation factors (VIF) for selected independent variables are very low, suggesting that no multicollinearity problems. All the VIFs are below 5 so that multicollinearity does not appear to be an issue. Multicollinearity is low when the variance inflation factors (VIFs) are below a rule-of-thumb threshold value of 10 and the tolerances larger than 0.1 (see for example Kennedy 1992, and Chatterjee and Hadi 2012). Therefore, we do not find any evidence of multicollinearity in our sample.

The descriptive statistics of the pay ratios, ownership, banks' efficiency and risk variables in this study is presented in Appendix 22. The list of control and instrumental variables are presented in Appendix 18.

4.4.4 Multiple Regressions

We estimate the following regression model to examine how CPS affects the level of efficiency and risk of banks:

$$\begin{aligned} EFFICIENCY_i = {} & \alpha + \beta_1 CPS_i + \beta_2 CEOAGE_i + \beta_3 CEODUAL_i + \\ & \beta_4 CEOEXPERIENCE_i + \beta_5 CEOGENDER_i + \\ & \beta_6 NEWCEO_i + \beta_7 RETIRINGCEO_i + \beta_8 IOP_i + \beta_9 IOV_i + \\ & \beta_{10} CRISIS_i + \beta_{11} SOX_i + \beta_{12} GEINDEX_i + \\ & + \beta_{13} DIRECTOWN_i + \beta_{14} DEBT_i + \beta_{15} BOARDSIZE_i + \\ & \beta_{16} TA_i + \epsilon_i \end{aligned} \tag{4.8}$$

Where $EFFICIENCY\ is$ the efficiency score derived from stochastic frontier analysis (SFA) model. It takes the value between 0 to 1. CPS_i is the main variable of interest that equals to the percentage of the CEO total compensation out of the total compensation of the top five executives. We include control variables in Equation (4.8) as suggested by prior efficiency literature. Definitions of all variables are presented in Appendix 18.

We account for several corporate governance elements that may determine the efficiency scores or bank performance. First of all, we include $CEOAGE_i$ and $CEOEXPERIENCE_i$ to control for the CEO age and CEO tenure. $CEOAGE_i$ is the age of the CEO (Bebchuk et al., 2011; Cornett, Marcus, & Tehranian, 2008; Mamatzakis & Bermpei, 2015; Mishra & Nielsen, 2000). $CEOEXPERIENCE_i$ represents the number of years the CEO has been with the firm (Cornett et al., 2008; Mamatzakis & Bermpei, 2015; Mishra & Nielsen, 2000). Firms that have more matured CEO develop more solid management skills. $CEODUAL_i$l is a dummy variable representing CEOs that are also the chairperson of their board (Core et al., 1999; K. W. Lee et al., 2008; Mamatzakis & Bermpei, 2015). CEOs earn excessive compensation when they also occupy the board chairmanship and increases the rent-seeking influence over the compensation process, hence affecting the banks performance (Core *et al.* 1999). $CEOGENDER_i$ takes a value of 1 for male CEOs (Hart, David, Shao, Fox, & Westermann-Behaylo, 2015; Newton, 2015). Women and men are different in their leadership behaviour and these differences may affect board functioning, consequently the banks performance (Haan & Vlahu, 2015). $NEWCEO_i$ is a dummy variable representing the arrival of a new CEO in the sample year (Kale et al., 2009)(Reddy et al., 2015). $RETIRINGCEO_i$ is a dummy variable representing CEOs aged over 60. It is a proxy for a CEO that is close to retirement (Kale et al., 2009).

We also include external governance elements as the control variables in this study. We include IOP_i and IOV_i. IOP_i is the percentage of firm *i* owned by institutions over a 5-year period (i.e., 20 quarters). The value of the coefficient reported is for IOP × 100. IOV_i is measured as the average standard deviation of institutional shareholding proportions across all investors in a firm over a 5-year period (i.e., 20 quarters). Both elements for external governance are following (Attig et al., 2012; Elyasiani & Jia, 2010,

2008; Jafarinejad et al., 2015). $CRISIS_i$ is a dummy variable representing the years 2007 to 2009, i.e., coinciding with the years of the global financial crisis. there is a negative impact of the financial crisis dummy on bank performance (Pathan & Faff, 2013). SOX_i is a dummy variable representing the years' post-SOX legislation, i.e., the year after 2002. The $GEINDEX_i$ is equal to the sum of the G and E indices. The G-Index (i.e. the, governance index) is from Gompers *et al.* (2003) and the E-Index (i.e., entrenchment index) is from Bebchuk *et al.* (2009). Higher values of the $GEINDEX_i$ are associated with weaker shareholder rights and a more retrenched management. $DIRECTOWN_i$ is a dummy variable representing instances when at least one board member also owns shares in the bank (Core et al., 1999). Past literatures suggesting that banks with higher bank ownership perform worse compared to banks with lower board ownership (see e.g., (Core *et al.*,, 1999; Beltratti and Stulz, 2012) $DEBT_i$ is the ratio of long-term debt-to-total assets. $BOARDSIZE_i$ represents the number of board members (Aebi, Sabato, & Schmid, 2012; K. W. Lee et al., 2008; Mamatzakis & Bermpei, 2015). As the proxy for bank size, we use the logarithm of total asset, TA_i (Agoraki et al., 2011; D. Al-Najjar, 2015; Guo et al., 2015; Le & Jaeger, 2015; Reddy et al., 2015).

Using ordinary least squares (OLS) regression does not eliminate the endogeneity issue. There may be two possible issues here. First, there may be variables that affect both bank efficiency and CEO pay that we did not account for in our model. Second, in place of pay disparity impacting firm's efficiency, it could be the case that highly skilful CEOs are attracted to efficient and well-performing banks in the first place.

To account for the endogeneity issues, we use a two-stage least square (2SLS) regression analysis. The first stage regression is an ordinary least square regression (OLS). A 2SLS regression approach is used in the second specification. The predicted values of the pay ratio are first computed. The pay ratio is the dependent variable (first stage regression), and the independent variables comprise all exogenous variables (second stage) along with instrument variables. The predicted values of the pay ratio are used in the second regression in place of the original values. We follow the same procedure in the regressions of the bank risk measures.

To address the endogeneity issues, we include instrumental variables in our multiple regressions. Following Kale *et al.* (2009) and Kini and Williams (2012), we use the number of vice presidents (number of VPs), and a dummy variable representing CFOs who are also a VP of their organization (CFO is VP). The higher the number of VPs, the higher the rent-seeking inducements are due to the great competition among VPs to become the CEO. Similarly, if the CFO is also a VP, the likelihood of becoming a CEO differs from non-VPs. We also include industry-median figures of the efficiency and risk variables as instrument variables.

4.5 Empirical Results

4.5.1 Bank Efficiency and Pay Disparity

We present the regressions of bank efficiency in Table 4.2. Column II presents the OLS findings. CPSi is the ratio of the CEO's total compensation-to-the total compensation of the top five executives including the CEO. Its coefficient is negative and significant at the 1% level, suggesting that CEOs that capture a higher proportion of the compensation of the top five executives fail to improve the bank efficiency. This is consistent with the hypothesis that larger rent-seeking inducements will result in poorer bank performance. We obtain similar findings using 2SLS regressions in Columns III and IV, i.e., the coefficient of CPS is negative and statistically significant at the 1% level. Using instrument variables, the coefficient of CPSi is -0.009, which suggests that a 1% increase in the pay disparity ratio leads to a decline in the bank efficiency score of -0.009. Using the simultaneous equation approach to 2SLS, we use the same instrument variables plus an additional one, i.e., the median SFA score of all banks in a given year. We present the results in Column IV and V of Table 4.2. The coefficient on the predicted pay ratio variable is -0.008 and significant at the 1% level. Thus, our findings are robust to alternative specifications, i.e., the inverse relationship between bank efficiency and rent-seeking inducements are economically and statistically significant.

The findings support the hypothesis that an inverse association between high pay disparity and bank efficiency exists, and that banks with high pay disparity underperform. The results remain the same when the total compensation is replaced by

(i) salary- (CPSii) (Panel B), (ii) current-(CPSiii) (Panel C), and (iii) contingent- (CPSiv) (Panel D) forms of compensation, respectively in the Appendix 23.

Table 4.2: Bank efficiency and CPS

Panel A: Results of Efficiency on CPSi - Total Compensation

	CPSi			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	EFFICIENCY	EFFICIENCY	EFFICIENCY	CPSi
CPSi	-0.001***	-0.009***		
CEOAGE	-0.147**	-0.180	-0.179	
CEODUAL	0.093**	0.129**	0.115**	-5.601
CEOEXPERIENCE	0.009	0.016	0.024**	-0.731
CEOGENDER	0.012	0.001	0.006	
NEWCEO	-0.002	-0.018	-0.010	-3.315*
RETIRINGCEO	-0.010	-0.011	-0.014	
IOPr	0.000***	0.000	0.000**	
IOV	-0.000***	-0.000***	-0.000***	
CRISIS	0.008	-0.008	-0.045	5.104
SOX	-0.148***	-0.092	-12.823	
GE INDEX	-0.004***	-0.003***	-0.004***	0.233**
DIRECTOR OWN	0.026*	-0.002	0.020	
DEBT	0.119**	0.076	0.058	
BOARDSIZE	-0.010	-0.143***	-0.142***	-8.334***
TA	0.108***	0.099***	0.100***	-3.624
TARP				-0.139
L5IO				-0.000**
EFFICIENCY MEDIAN			-111.994	
PREDICTED CPSI			-0.008***	
PREDICTED EFFICIENCY				19.690
CFOISVP				5.503***
NUMBEROFVPS				-0.707*
Constant	0.171	0.802**	32.315	57.360***
R-Squared	0.47	0.14		
Number of Observation	1,045	763	756	756
Anderson-Rubin Wald F-Statistics for joint relevance		9.083***	Instruments used in IV (2SLS)	CFO is VP Number of VPs EFFICIENCY industry-year median
Hansen J-statistic		1.434		
Wald chi2		458.540***		
Durbin-Wu-Hausman test of endogeneity		6.902***		
First-stage F-statistic		3.880***		

EFFICIENCY is efficiency scores using Stochastic Frontier Analysis. CPSi is the percentage of the CEO total compensation out of the total compensation of the top five executives. CEOAGE is the logarithm of the CEO age. CEODUAL is a dummy variable of 1 if the CEO is also the chairman and 0 if otherwise. CEOEXPERIENCE is a dummy variable of 1 if the tenure of the CEO is more than seven years and 0 if otherwise. CEOGENDER is 1 if the CEO is a male and 0 if otherwise. NEWCEO is a dummy variable of 1 if there is a new appointment of CEO in the year and 0 if otherwise. RETIRINGCEO is a dummy variable of 1 if the age of the CEO is more than 60 and 0 if otherwise. IOV is the institutional ownership volatility calculated as the average of the standard deviations of the quarterly institutional shareholding proportions of the firm including the sample year and the four years preceding it (i.e., 20 quarters). IOPr is the proportion of shares held by institutional investors calculated as the aggregate shareholdings proportion of firm over 20 quarters. IOV is the institutional ownership volatility calculated as the average of the standard deviations of

the quarterly institutional shareholding proportions of the firm including the sample year and the four years preceding it (i.e., 20 quarters). Crisis is a dummy variable of 1 if the period is 2007-2009 and 0 if otherwise. SOX is a dummy variable of 1 if the year is 2002 onwards and 0 if the year is 2000 and 2001. GE INDEX is the percentage of the scores of the combination of G-Index and E-Index. DIRECTOR OWN is a dummy variable of 1 if the CEO has shares with the firm and 0 if otherwise. DEBT is the long-term debts divided by total assets. BOARDSIZE is the logarithm of number of the board members. TA is the logarithm of the total assets as a proxy for the size of the firm. TARP is a dummy variable of 1 if the bank is the recipient of the Troubled Asset Relief Program (TARP) and 0 if otherwise. L5IO is the number of shares held by the largest five institutional ownership. EFFICIENCY MEDIAN is the industry-year median efficient scores using Stochastic Frontier Analysis. PREDICTED CPSi is the predicted CPSi (percentage of the CEO total compensation out of the total compensation of the top five executives) generated from the simultaneous regression. PREDICTED EFFICIENCY is the predicted efficiency scores (Stochastic Frontier Analysis) generated from the simultaneous regression. CFOISVP is a dummy variable of 1 if the CFO of the firm is one of the VPs. NUMBEROFVPS is the number of the vice presidents.

* p<0.1; ** p<0.05; *** p<0.01

Source: Compiled by author from data obtained from Bankscope, Execucomp and Compustat

4.5.2 Stock Return Volatility and Pay Disparity

In Table 4.3, we present the results from running multiple regressions on the standard deviation of annual bank stock returns (SDAR). While CPS adversely affects bank efficiency, banks with lower SDAR are associated with higher CPS. Using OLS regression, the coefficient of CPSi (i.e., representing the slice of the top five executives' pay that belongs to the CEO) is negative and significant at the 1% level.

Results based on 2SLS regressions are presented in Column III, and the coefficient of CPSi (total CEO compensation divided by total compensation of top five management team) is negative and significant at the 1% level. The coefficient is -0.004, which suggests that a 1% increase in CPSi decreases the bank's standard deviation in its annual stock returns by 0.004. We present the results from estimating the simultaneous equations in Columns IV and V. The coefficient of the predicted CPSi variable is negative and significant at the 1% level. Our results remain constant upon replacing total compensation by (i) salary- CPSii (Panel B), (ii) current- CPSiii (Panel C), and (iii) contingent- CPSiv (Panel D) forms of compensation, respectively (please refer to Appendix 24). The overall results support our hypothesis that the higher the disparity pay ratio between the CEO and the top five management team, the lower the top management team risk-taking propensity.

Table 4.3: Return Volatility and CPS

Panel A: Results of Bank Return Volatility (Standard Deviation of Annual Stock Return-SDAR) on CPS- Total Compensation

	CPSi			
	SD Annual Stock Return			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	SDAR	SDAR	SDAR	CPSii
CPSi	-0.000***	-0.004***		
CEOAGE	-0.086*	-0.029	-0.102*	
CEODUAL	0.005	0.010	-0.000	-2.846
CEOEXPERIENCE	-0.006	-0.002	-0.001	-0.085
CEOGENDER	-0.030**	-0.035**	-0.028**	
NEWCEO	0.007	0.009	0.011	-2.283
RETIRINGCEO	0.009*	0.009	0.013**	
IOPR	-0.000	-0.000***	-0.000*	
IOV	-0.000*	-0.000*	-0.000**	
CRISIS	0.051***	0.127***	-0.044	4.873
SOX	-0.037***	-0.022	0.042	
GE INDEX	-0.000	0.000	-0.000	0.138*
DIRECTO OWN	-0.003	-0.015	-0.004	
DEBT	0.149***	0.142***	0.133***	
BOARDSIZE	0.003	-0.043**	-0.035**	-9.564***
TA	-0.008***	-0.013***	-0.011***	-1.195
TARP				-0.293
L5IO				-0.000***
SDAR MEDIAN			1.687	
PREDICTED CPSI			-0.003***	
PREDICTED SDAR				-27.735
CFOISVP				5.575***
NUMBEROFVPS				-0.748*
Constant	0.346***	0.457***	0.352	59.913***
R-Squared	0.48	0.25		
Number of Observation	991	730	723	723
Anderson-Rubin Wald F-Statistic for joint relevance		9.309***	Instruments used in IV (2SLS)	CFO is VP Number of VPs SDAR industry-year median
Hansen J-statistic		0.0420		
Wald chi2		490.260***		
Durbin-Wu-Hausman test of endogeneity		25.323***		
First-stage F-statistic		3.780***		

SDAR is the standard deviation of annual stock return. CPSi is the percentage of the CEO total compensation out of the total compensation of the top five executives. CEOAGE is the logarithm of the CEO age. CEODUAL is a dummy variable of 1 if the CEO is also the chairman and 0 if otherwise. CEOEXPERIENCE is a dummy variable of 1 if the tenure of the CEO is more than seven years and 0 if otherwise. CEOGENDER is 1 if the CEO is a male and 0 if otherwise. NEWCEO is a dummy variable of 1 if there is a new appointment of CEO in the year and 0 if otherwise. RETIRINGCEO is a dummy variable of 1 if the age of the CEO is more than 60 and 0 if otherwise. IOV is the institutional ownership volatility calculated as the average of the standard deviations of the quarterly institutional shareholding proportions of the firm including the sample year and the four years preceding it (i.e., 20 quarters). IOPr is the proportion of shares held by institutional investors calculated as the aggregate shareholdings proportion of firm over 20 quarters. IOV is the institutional ownership volatility calculated as the average of the standard deviations of the quarterly institutional shareholding proportions of the firm including the sample year and the four years preceding it (i.e., 20 quarters). Crisis is a dummy variable of 1 if the period is 2007-2009 and 0 if otherwise. SOX is a dummy variable of 1 if the year is 2002 onwards and 0 if the year is 2000 and 2001. GE INDEX is the percentage of the scores of the combination of G-Index

and E-Index. DIRECTOR OWN is a dummy variable of 1 if the CEO has shares with the firm and 0 if otherwise. DEBT is the long-term debts divided by total assets. BOARDSIZE is the logarithm of number of the board members. TA is the logarithm of the total assets as a proxy for the size of the firm. TARP is a dummy variable of 1 if the bank is the recipient of the Troubled Asset Relief Program (TARP) and 0 if otherwise. L5IO is the number of shares held by the largest five institutional ownership. SDARMEDIAN is the industry-year median standard deviation of annual stock return. PREDICTED CPSi is the predicted CPSi (percentage of the CEO total compensation out of the total compensation of the top five executives) generated from the simultaneous regression. PREDICTED SDAR is the predicted standard deviation of stock return generated from the simultaneous regression. CFOISVP is a dummy variable of 1 if the CFO of the firm is one of the VPs. NUMBEROFVPS is the number of the vice presidents.

* p<0.1; ** p<0.05; *** p<0.01

For robustness of analysis, we repeat the regressions from Table 4.3 but using the standard deviation of daily stock returns as the dependent variable. We present the findings in Appendix 25. The results remain the same, i.e. all the variables representing CPS (CPSi, CPSii, CPSiii, and CPSiv) exert a downward and statistically significant effect on the measures of standard deviation.

4.5.3 Firm Insolvency Risk and Pay Disparity

Using standard deviation in bank stock returns does not provide a full picture of a bank's solvency. Many banks suffer from stock price declines but are then rescued by their government as occurred during the 2007-2008 subprime mortgage crisis. Thus, besides share price fluctuations, it is important to consider a measure that captures a bank's solvency risk since not all banks that suffer a decline in their share prices are rescued by their governments. Solvency risk due to unsystematic risk can be the result of a decline in the bank's capital, or a sudden deterioration in the bank's loan book, or internal fraud and the like. As explained earlier, we calculate the Z-score to proxy for a bank's solvency risk. The Z-score shows the number of standard deviations a bank's ROA must drop to below its expected value before equity is said to be depleted (Soedarmono *et al.*, 2013). The lower the bank's Z-score, the higher is its probability of default. We perform the multiple regressions on the Z-scores and present our findings in Table 4.4.

The coefficient of CPSi is positive and statistically significant in the 2SLS regressions, i.e., high values of CPSi are associated with high Z-scores. Note that the Z-score is inversely related to bankruptcy/insolvency risk. Thus, consistent with the findings on the stock market-based risk measures, we find that the pay disparity between the CEO and the rest of the employees is higher at banks with little bankruptcy risk. The findings support our hypothesis that stable firms are more likely to afford high CPS. The Z-score

in Table 4.4 is based on a three-year rolling window. For robustness, we compute the Z-scores using a five-year rolling window and present our findings in Appendix 26. The results remain consistent.

Table 4.4: Bank Stability and CPS- Z-Score 3

Panel A: Results of Bank Stability (ln(Z-Score3)) on CPSi - Total Compensation

	CPSi			
	Bank Stability			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	ln(Z-Score3)	ln(Z-Score3)	ln(Z-Score3)	CPSi
CPSi	0.006*	0.102***		
CEOAGE	1.227	0.441	0.595	
CEODUAL	0.160	0.288	0.422	-4.291
CEOEXPERIENCE	0.534***	0.573***	0.476***	-1.185
CEOGENDER	0.210	0.483	0.374	
NEWCEO	-0.126	-0.063	-0.108	-2.436
RETIRINGCEO	0.038	0.070	0.116	
IOPR	-0.001**	0.000	-0.001	
IOV	-0.000	0.000	0.000	
CRISIS	0.086	-1.250***	-0.984**	4.363
SOX	0.375	0.979	1.385*	
GE INDEX	0.017**	0.002	0.013	0.145*
DIRECTOR OWN	0.127	0.125	-0.166	
DEBT	-1.961***	-1.496*	-0.906	
BOARDSIZE	-0.427	0.485	0.316	-7.417**
TA	0.131*	0.294**	0.228**	-1.454**
TARP				-0.358
L5IO				-0.000**
ZSCORE3 MEDIAN			0.003	
PREDICTED CPSI			0.078***	
PREDICTED LNZSCORE3				6.072
CFOISVP				5.093***
NUMBEROFVPS				-0.742*
Constant	1.226	-3.615	-2.829	43.942***
R-Squared	0.16	0.00		
Number of Observation	1,030	751	747	747
Anderson-Rubin Wald F-Statistic for joint relevance		8.427***	Instruments used in IV (2SLS)	CFO is VP Number of VPs Ln(z-score3) industry-year median
Hansen J-statistic		0.274		
Wald chi2		121.110***		
Durbin-Wu-Hausman test of endogeneity		11.001***		
First-stage F-statistic		3.840***		

Ln(z-score3) is the logarithm of the z-score calculated using the three-year rolling window. CPSi is the percentage of the total compensation of CEO out of the total compensation of the top five executives. CEOAGE is the logarithm of the CEO age. CEODUAL is a dummy variable of 1 if the CEO is also the chairman and 0 if otherwise. CEOEXPERIENCE is a dummy variable of 1 if the tenure of the CEO is more than seven years and 0 if otherwise. CEOGENDER is 1 if the CEO is a male and 0 if otherwise. NEWCEO is a dummy variable of 1 if there is a new appointment of CEO in the year and 0 if otherwise. RETIRINGCEO is a dummy variable of 1 if the age of the CEO is more than 60 and 0 if otherwise. IOV is the institutional ownership volatility calculated as the average of the standard deviations of the quarterly

institutional shareholding proportions of the firm including the sample year and the four years preceding it (i.e., 20 quarters). IOPr is the proportion of shares held by institutional investors calculated as the aggregate shareholdings proportion of firm over 20 quarters. IOV is the institutional ownership volatility calculated as the average of the standard deviations of the quarterly institutional shareholding proportions of the firm including the sample year and the four years preceding it (i.e., 20 quarters). Crisis is a dummy variable of 1 if the period is 2007-2009 and 0 if otherwise. SOX is a dummy variable of 1 if the year is 2002 onwards and 0 if the year is 2000 and 2001. GE INDEX is the percentage of the scores of the combination of G-Index and E-Index. DIRECTOR OWN is a dummy variable of 1 if the CEO has shares with the firm and 0 if otherwise. DEBT is the long-term debts divided by total assets. BOARDSIZE is the logarithm of number of the board members. TA is the logarithm of the total assets as a proxy for the size of the firm. TARP is a dummy variable of 1 if the bank is the recipient of the Troubled Asset Relief Program (TARP) and 0 if otherwise. L5IO is the number of shares held by the largest five institutional ownership. ZSCCORE3 MEDIAN is the industry-year median standard deviation of daily stock return. PREDICTED CPSi is the predicted CPSi (percentage of the total compensation of the CEO out of the total compensation of the top five executives) generated from the simultaneous regression. PREDICTEDLNZSCORE3 is the predicted standard deviation of daily stock return generated from the simultaneous regression. CFOISVP is a dummy variable of 1 if the CFO of the firm is one of the VPs. NUMBEROFVPS is the number of the vice presidents.

* p<0.1; ** p<0.05; *** p<0.01

4.5.4 Institutional Ownership, Efficiency, Risk, and Pay Disparity

The OLS regressions in Table 4.2 suggest that there exists a positive association between institutional ownership and bank efficiency exists. The coefficient of the variable IOP is positive and statistically significant. Conversely, the coefficient of IOV, which represents the standard deviation in the quarterly shareholdings of institutional investors, is negative and statistically significant. Thus, banks that are less efficient are associated with higher volatility in the shareholdings of their institutional investors.

4.6 Conclusions

This paper empirically examines how CEO pay slice (CPS) affects banks' efficiency and risk levels. We follow the measurement of pay disparity introduces by Bebchuk *et al.* (2011). CPS measures the gap between CEO pay and the pay of the bank's top five executives. Bebchuk *et al.* (2011) defined CPS as the fraction of the total compensation of the firm's top-five executive team captured by the CEO. We extend the CPS measures by Bebchuk *et al.* (2011) into three other ratios namely, CPSii- salary, CPSiii- current and CPSiv- contingent. The higher the CPS, the larger the disparity in CEO pay is. We find that higher pay disparity is associated with lower bank efficiency. Thus, the higher compensation of the CEO does not translate into higher bank efficiency.

We have made a contribution to the literature by documenting the link between CPS and bank efficiency and risk. Despite the public outcry around the CEOs pay at the largest US financial institutions, there are very limited number of papers that examine

the link between CEO pay and bank efficiency. To the best of our knowledge, the only study that directly addresses the topic is Matousek and Tzeremes (2016). The authors study the effect of CEO compensation on bank's technical efficiency using the non-parametric Data Envelopment Analysis (DEA). According to the authors, a minimum salary level exists below which, CEO compensation is negatively related to bank performance which is inconsistent with the findings based on parametric approaches. We use parametric Stochastic Frontier Analysis (SFA) as a measure of efficiency.

We provide evidence that high CPS affects bank efficiency. The CPS coefficient is negative and significant at the 1% level, suggesting that CEOs that capture a higher proportion of the compensation of the top five executives fail to improve the bank efficiency. This is consistent with the hypothesis that larger rent-seeking inducements will result in poorer bank performance. The results remain the same with all four types of CPS breakdowns i.e., (i) total compensation- (CPSi) (ii) salary- (CPSii), (iii) current- (CPSiii), and (iv) contingent- (CPSiv). Thus, our findings are robust to alternative specifications, i.e., the inverse relationship between bank efficiency and rent-seeking inducements are economically and statistically significant.

Conversely, CPS is inversely associated with the standard deviation of the bank's stock returns and its bankruptcy risk. In our analysis, we use the standard deviation of one-year stock return volatility (SDAR) and daily stock return volatility (SDD) as analogues for bank risk. We also use the bankruptcy risk measure, Z- Score following Agoraki *et al.* (2011) to proxy the risk-taking behaviour of banks since not all banks that suffer a decline in their share prices are rescued by their governments. The Z-score is directly related to a bank's default risk (Agoraki *et al.*, 2011). The Z-score shows the number of standard deviations a bank's ROA must drop to below its expected value before equity is said to be depleted (Soedarmono *et al.*, 2013). The lower the bank's Z-score, the higher is its probability of default.

Our finding reveals that, our measures of risks in our study support our hypotheses H2 and H3. Our H2 states that high pay disparity positively affects the bank's risk and H3 states that high pay disparity is associated with higher insolvency risk. Our results show that the coefficient of CPSi (total CEO compensation divided by total compensation of top five management team) is negative and significant at the 1% level for all tests that

we conduct (OLS, 2SLS and simultaneous equations). Our results remain constant upon replacing total compensation by (i) salary- CPSii, (ii) current- CPSiii, and (iii) contingent- CPSiv, respectively. The overall results support our hypothesis that the higher the disparity pay ratio between the CEO and the top five management team, the lower the top management team risk-taking propensity.

H3 states that banks with high pay disparity is associated with higher insolvency or bankruptcy risk. The coefficient of CPS is positive and statistically significant in the 2SLS regressions, i.e., high values of CPS are associated with high Z-scores. Note that the Z-score is inversely related to bankruptcy/insolvency risk. Thus, consistent with the findings on the stock market-based risk measures for our H2 above, we find that the pay disparity between the CEO and the top five management team is higher at banks with little bankruptcy risk. The findings support our hypothesis that stable firms are more likely to afford high CPS. Thus, stable banks are associated with high CEO pay disparity.

We also find that institutional shareholdings and stability positively contribute to bank's efficiency. We use two measures following Elyasiani *et al.* (2010), i.e. the proportion of shares held by institutional investors (IOP) and the standard deviation of the institutional shareholding proportions (IOV) to proxy for stability of institutional investors. The higher IOV, the lower is the institutional ownership volatility. The coefficient of the variable IOP is positive and statistically significant. Conversely, the coefficient of IOV, which represents the standard deviation in the quarterly shareholdings of institutional investors, is negative and statistically significant. Thus, banks that are less efficient are associated with higher volatility in the shareholdings of their institutional investors.

We also find additional findings that the 2008 global financial crisis period directly affected banks' risk-taking behaviour among management team. We use the variable $CRISIS$ that takes the value of 1 if the period is 2007-2009 and 0 if otherwise. The coefficient of the variable $CRISIS$ is positive and significant at 1% level on the regression on the stock market-based risk measures (standard deviation of stock returns). We find consistent findings on the analysis of the insolvency risk measures on the variable $CRISIS$. The coefficient of $CRISIS$ is negative and significant at 1% level. Note that the lower the Z-score is, the higher the bankruptcy/insolvency risk. Thus, during the global

financial crisis, the stock prices of banks are volatile and the insolvency risk of banks are higher.

We do not find any significant result on the analysis of the relationship between the financial crisis and bank efficiency. Taken together, our results are consistent with our hypothesis that higher CPS is indeed associated with rent-seeking theory and agency theory. Our research is not only contributing to a wide range of literatures on bank efficiency and risk, but also provides several practical implications for regulators in monitoring banks' operations and excessive risk-taking behaviour among banks managements. Our findings provide a practically useful way to assess the association between the CEO pay slice (CPS) with the level of efficiency and insolvency risk of the banks. Indeed, it is known that higher level of CPS may not always accurately reflect "true'' level of bank efficiency and risks. It is important for institutional investors in assessing the bank efficiency and risk managed by CEO that have large pay disparity between the CEO and other top management teams.

Chapter 5

Summary and Concluding Remarks

The financial crisis in 2008, lead to ongoing debate on whether the bankruptcy law is efficient in rehabilitating financial constraints firms as well as the issues on government bailout practises for failures institutions in the US. This chapter summarises and evaluates the major findings of this thesis regarding the bidders' performance after M&A involving financial constraints targets, earning management practices among firms that involve in restructuring and the relationship between bank efficiency and CEO pay disparity. Two of the research findings employ M&A and restructuring as the sample; our third research uses the banking sector as the sample.

The main objectives of our first research paper are the corporate performance of bidders that acquired FCTs and bankrupt targets. We also extend our research scope in analysing the effect of the discount or premium in the deals. We find some consistent results of bidders that acquire FCTs or bankruptcy targets.

Previous literature has not being consistent regarding the benefits of acquiring FCTs or bankruptcy targets. In addition to the recorded M&A and the deals value that have been reported as being increased since before the 2008 global financial crisis (Thomson Reuters, 2014), the deal value in the first three-quarters of 2014 reached almost US$1 trillion (KPMG, 2015). There is a trend for bidders to acquire FCTs or bankruptcy targets. There are limited studies on the characteristics of bidders and targets engaged in M&A involving FCTs or bankruptcy targets. Furthermore, the analysis of comparing both the FCTs and bankruptcy targets with healthy targets in the same research is still lacking. We aim to fill the gap in the literature by having a comparison of these types of targets.

After thoroughly conducting econometrics analysis, our final findings are:

(i) that bidders of financially constrained targets (FCTs) pay lower M&A premiums; and

(ii) they earn higher M&A announcement period CARs than bidders of unconstrained targets.

Even though the application of the Kaplan-Zingales Index (1997) has been applied by Khatami *et al.* (2015) to measure the level of financial constraints of targets, the findings of this study are contrary to their findings. They claim that financial constraints of target companies significantly increase acquisition premiums for targets. In our analysis, however, we find that financially constrained targets are acquired at discounts. As a robustness test, we conducted a similar test with another sample; we report a consistent result with the FCTs sample, especially in terms of corporate performance of bidders' post-acquisition. The findings do not suggest that the acquisitions of FCTs or bankruptcy targets are better than the acquisitions of non-FCTs or non-bankruptcy. We also observe that the long-run stock performance of bidders of FCTs and their operating performance is not remarkable. However, this empirical research establishes the merits of acquiring FCTs or bankruptcy targets as a corporate reorganization strategy using market-based data and investors' perceptions of value.

Our main objective of the second empirical research is to examine the level of EM activities among the targets involved in restructuring in carve-outs, sell-offs, spin-offs, and other divestitures. We also analyse the extent of the level of EM activities of targets, and the impact on the targets' performance. Specifically, we also analyse the impact of the level of EM activities with the changes in operational performance, ΔROA, the short-term stock performance of targets, CARs, long-term stock performance of targets, and BHARs as well as the stock volatility of stock returns of targets.

Our empirical findings for our second research reports that, on average, target companies manage earnings downward through both accrual-based and real EM the year before the announcement, in the year of the announcement and continue even after the announcements. We find that there are differences in ΔROA, CARs, BHARs and SDARs between AEM and BEM groups associated with EM activities. We find that there is a negative relationship between the ΔROA and the EM for the carve-out sample. We do not find any significant coefficient of EM proxy for other samples.

From an economics perspective, the findings suggest that firms that manage their earnings above the industry year median EM index normally have fewer increments in

the changes in ROA. Thus, firms are believed to have reversed their previous transaction in later years after the restructuring year. As our second empirical research is more on an exploratory basis, there is a need for further analysis on each type of restructuring in more detail. As mentioned earlier, the results for corporate performance are mixed. The results for CARs and BHARs also show the same pattern as the changes in ROA. We also find a negative relationship between the post-SDARs and EM. Firms that manage earnings AEM have lesser stock volatility compared with firms that manage BEM. From an economics perspective, we can interpret these findings as an explanation of the need for managers to manage earnings to hype or smooth the stock prices.

Our final empirical chapter renders new evidence on the relationship of CEO pay disparity on bank efficiency and risk-taking behaviour among bank managers. We report that CEO pay disparity has an inverse effect on bank efficiency. Literature on CEO and pay disparity with relation to bank efficiency is limited. Our main supposition is that high CEO pay disparity is associated with lower bank efficiency and more stability in terms of stock returns volatility. In addition, we inspect whether the existence of the institutional investors moderate the association between the CEO pay disparity and bank efficiency. We document that banks with a higher efficiency index have higher institutional ownership and less stability of ownership. We extend our analysis by including a GE-Index, a combination of G-Index and E-Index that represents the proxy for corporate governance in our last empirical research. We find that firms with a high efficiency index have a lower GE-Index. From an economics perspective, this means that highly efficient banks have a greater tendency towards having a stronger shareholder right or lower management entrenchment.

Econometrically, we use the HSM to correct for a selection bias, omitted variables and endogeneity issues. Our results are robust across three different econometric approaches and confirm that a firm with high CEO pay disparity is less efficient than firms that have lower CEO pay disparity.

Our empirical results provide a detailed analysis on the differential compensation components of CEO's and the top management team's compensation package and how it could affect bank performance. Our findings suggest that the tournament theory does not really explain the actual condition in the real world when it comes to the efficiency

level of bank's productivity and stock performance. The high pay disparity between the CEO and the rest of the top management suggests that it could lead to adverse results. The existence of institutional ownership could moderate the aggressive action of CEOs or CEO hubris. Supporting previous research on the benefits of having good corporate governance in place could provide a good internal monitoring system in firms.

The findings of our third essay on banking are beneficial to not only to the banking industry and academia, but also to policy makers. The findings serve to support evidence to the newly imposed regulation by the Dodd-Frank Act in the US. This act imposed tighter regulation in 2010 after the financial crisis through the SEC; it states that companies are required to produce and present their CEO-TMT ratios by 2018. The new implementation is needed to repair the disastrous loss of trust in corporate leaders that is destroying the market economy.

The detailed findings on the different categories of compensation that we have presented in this research are useful for the policy maker. This is because the need to protect the various arrays of investors and consumers means that detailed disclosure by companies is needed, not just the total CPS. This is important as different categories of pay will have a different impact on decision making. To date there are no clear detailed guidelines on the disclosures.

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Appendices

Appendix 1: Variables Definition- Mergers and Acquisitions of Targets in Corporate Financial Distress and Bankruptcy

Variables	Definition
Dependent variables	
CARS	The cumulative abnormal return of the bidders in percentage over a three-day or four-day event window (-2, 0) and (-3,0) where 0 is the day of the announcements.
BHRS	The buy-and-hold returns in percentage for bidders for the 12 and 36 months following the announcement
BHARS	The buy-and-hold abnormal returns in percentage for bidders for the 12 and 36 months following the announcement
ROAS	The return on assets ratio of the bidder one year prior to the M&A announcement and 1 to 3 years' post M&A announcement
DISCOUNT/PREMIUM	Percentage of the deal value divided by the targets market value four weeks prior to the announcement
FC	A dummy variable of 1 representing firms that are fall under the financially constrained zone according to Kaplan-Zingales Index (1997) and 0 representing healthy firms
BANKRUPTCY	A dummy variable of 1 if the seller is bankrupt or goes bankrupt during the transaction and 0 if otherwise.
Explanatory Variables	
FC	A dummy variable of 1 representing firms that are fall under the financially constrained zone according to Kaplan-Zingales Index (1997) and 0 representing healthy firms
BANKRUPTCY	A dummy variable of 1 if the seller is bankrupt or goes bankrupt during the transaction and 0 if otherwise.
DISCOUNT/PREMIUM	Percentage of the deal value divided by the targets market value four weeks prior to the announcement
Control Variables	
ACA	Equals to 1 if the bidder only acquired certain assets only
TECHBUBBLE	a dummy variable that takes a value of 1 for years 2001, 2002, 2003, and 2004 and 0 otherwise
SOX	A dummy variable that takes a value of 1 for years from 2002 onwards and 0 otherwise
CRISIS	a dummy variable that takes a value of 1 for years 2008, 2009, 2010, 2011 and 2012 and 0 otherwise
RELATED	equals to 1 if the buyer's and target's SICs are equal at the two-digit level
MULTIPLEBID	Equals to number of bidders
FRIENDLY	equals to 0 if the bid status is friendly and 1 if hostile
ICR	Interest coverage ratio of the bidder calculated as EBIT divided by interest expenses
ROEBIDDER	Return on equity of the bidder
COMPLETION	Is measured as the number of days between deal closing and announcement date.
ALLCASH	Equals to 1 if the deal is financed by all cash
TENDEROFFER	Equals to 1 if the deal is tender offer
TACOUNT	Equals to number of target's advisor
AACOUNT	Equals to number of bidder's advisor
SIZE	Log of book value of total assets of the bidder
SIZETARGET	Log of book value of total assets of the target
DEBTRATIO	The bidder's total liabilities divided by market value of equity, as of four weeks prior to the announcement
TECHTARGET	Equals 1 if the target is a high-tech firm
TECHBIDDER	Equals 1 if the bidder is a high-tech firm

TOBIN'S Q	Equals to market value of assets (market value of equity- book value of equity + total assets) scaled by total assets
TARGETADVISOR	Equals 1 if the target has an advisor and 0 if otherwise
MACCTIVITY	Equals the logarithm of total value of the mergers and acquisition in the same year
IMR	Equals to the inverse mill ratios

Source: Compiled by author from data obtained from COMPUSTAT, Thomson One Banker, CRSP, and statista.com

Appendix 2: Correlation matrix for the dependent variables in probit regression (first-stage)

This table presents a Pearson correlation matrix of key variables of interest for the sample of firms included in our sample. The sample covers for all control variables for the period of 1985 to 2012. All variables are defined in Appendix 1.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
DEBTRATIO	1	1																	
ICR	2	-0.01	1																
SIZE	3	0.05*	-0.01	1															
RELATED	4	-0.1*	-0.01	-0.13*	1														
CRISIS	5	-0.01	0.02	0.10*	0.02	1													
SOX	6	-0.03	0.03*	0.14*	0.04*	0.54*	1												
ALLCASH	7	-0.02	0.03	0.02	0.14*	0.09*	0.08*	1											
FRIENDLY	8	0.03	0.00	0.17*	-0.42*	0.02	0.09*	-0.44*	1										
AACOUNT	9	0.02	-0.01	0.17*	-0.12*	0.08*	0.14*	-0.29*	0.39*	1									
SIZETARGET	10	0.02	-0.03	0.59*	0.10*	0.09*	0.13*	0.07*	-0.12*	0.13*	1								
ACA	11	-0.03	0.01	-0.12*	0.29*	-0.05*	-0.14*	0.39*	-0.78*	-0.45*	0.09*	1							
TENDEROFFER	12	0.04*	0.02	0.10*	-0.21*	0.04*	-0.01	0.10*	0.29*	0.17*	-0.01	-0.26*	1						
MULTIPLEBID	13	0.01	-0.01	0.06*	-0.03*	-0.02	-0.03*	-0.04*	0.08*	0.13*	0.06*	-0.12*	0.14*	1					
MAACTIVITY	14	0.03	0.00	0.07*	-0.06*	-0.10*	-0.14*	-0.10*	0.16*	0.09*	0.02	-0.16*	0.06*	-0.02	1				

TACOUNT	15	0.00	-0.01	0.22*	-0.28*	0.09*	0.14*	-0.34*	0.69*	0.52*	0.04*	-0.68*	0.30*	0.17*	0.12*	1		
COMPLETION	16	0.00	-0.01	0.08*	0.11*	-0.01	-0.04*	0.17*	-0.17*	-0.13*	0.11*	0.13*	-0.10*	-0.01	-0.02	-0.12*	1	
TECHTARGET	17	0.02	-0.05*	-0.06*	0.01	-0.11*	-0.14*	-0.06*	0.02	0.02	0.08*	-0.01	-0.01	0.04*	0.01	0.02	-0.03	1	
TECHBIDDER	18	0.03*	-0.04*	-0.22*	0.07*	-0.10*	-0.16*	-0.01	-0.15*	-0.04*	0.05*	0.12*	-0.03	0.03	-0.01	-0.10*	0.01	0.56*	1

*statistically significant at the 5% margin; and **statistically significant at the 1% margin.

Appendix 3: Variance Inflation Factor (VIF) for the first stage regression

This table presents a Variance Inflation Factors (VIF) of key variables of interest for the sample of firms included in our sample. The sample covers for all control variables for the period of 1985 to 2012. All variables are defined in Appendix 1.

Variable	VIF	1/VIF
FRIENDLY	3.21	0.311253
ACA	2.79	0.358744
TACOUNT	2.39	0.418006
SIZEBLOG	1.88	0.530753
SIZETLOG	1.69	0.590526
TECHBIDDER	1.64	0.611011
SARBANES	1.57	0.637914
TECHTARGET	1.48	0.674106
AACOUNT	1.46	0.685923
ALLCASH	1.45	0.689575
FINCRISIS	1.42	0.704756
TENDEROFFER	1.25	0.799079
RELATED	1.24	0.809573
MAACTIVITY	1.09	0.920127
COMPLETION	1.08	0.925796
BIDCOUNT	1.07	0.937945
INTCOVBIDDER	1.01	0.985511
DEBTRATIO	1.01	0.986937
Mean	1.60	

Appendix 4: Correlation matrix for the dependent variables in multiple regressions (second-stage)

This table presents a Pearson correlation matrix of key variables of interest for the sample of firms included in our sample. The sample covers for all control variables for the period of 1985 to 2012. All variables are defined in Appendix 1.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
FC	1	1																				
PREMIUM	2	0.0	1																			
DEBT-RATIO	3	0.0	0.0	1																		
ICR	4	-0.1*	0.0	-0.0	1																	
SIZE	5	-01*	0.0	0.0	0.0	1																
RELATED	6	0.0	0.0	0.0*	0.0	-0.1*	1															
CRISIS	7	0.0	0.0	-0.1*	0.0	0.1*	0.0	1														
SOX	8	-0.1*	0.0	0.0	0.0*	0.1*	0.0*	0.5*	1													
ALLCASH	9	-0.2*	0.0	0.0	0.0	0.0	0.1*	0.1*	0.1*	1												
FRIENDLY	10	-0.2*	0.0	0.0	0.0	0.2*	-0.4*	0.0	0.1*	-0.4*	1											
ACCOUNT	11	0.1*	0.0	0.0	0.0	0.2*	-0.1*	0.1*	0.1*	-0.3*	0.4*	1										
SIZETARGET	12	0.0	0.0	0.0	0.0	0.6*	0.1*	0.13*	0.1*	0.1*	-0.1*	0.1*	1									
ACA	13	0.0	0.0	0.0	0.0	-0.1*	0.3*	-0.0*	-0.1*	0.4*	-0.8*	-0.4*	0.1*	1								

TENDER-OFFER	14	0.0	0.0	0.0*	0.0	0.1*	-0.2*	0.0*	0.0	0.1*	0.3*	0.2*	-0.0	-0.3*	1						
MULTIPLEBID	15	-0.1*	0.0	0.0	0.0	-0.1*	0.3*	-0.1*	-0.1*	0.4*	-0.8*	-0.5*	0.1*	1.0	0.1*	1					
MAACTIVITY	16	0.0	0.0	0.0*	0.0	0.1*	-0.2*	0.0*	0.0	0.1*	0.3*	0.2*	0.0	-0.3*	0.1*	0.0	1				
TACOUNT	17	0.1*	-0.0	0.00	-0.01	0.2*	-0.3*	0.1*	0.1*	-0.3*	0.7*	0.5*	0.0*	-0.7*	0.3*	0.2*	0.1*	1			
COMPLETION	18	0.1*	0.0	0.0	0.0	0.1*	-0.0*	0.0	-0.0*	-0.0*	0.1*	0.1*	0.1*	-0.1*	-0.1*	0.0	0.0	-0.1*	1.0		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
TECHTARGET	19	0.0	0.0	0.0	0.0	0.1*	-0.1*	-0.1*	-0.1*	-0.1*	0.2*	0.1*	0.0	-0.2*	0.0	0.0*	0.0	0.0	0.0	1.0		
TECHBIDDER	20	0.1*	0.0	0.0	0.0	0.2*	-0.3*	0.0*	0.1*	-0.3*	0.7*	0.5*	0.0*	-0.7*	0.0	0.0	0.0	-0.1*	0.0	0.6*	1.0	
IMR	21	-0.1*	0.1*	0.0	0.0	0.01*	0.1*	0.0	-0.0*	0.2*	-0.2*	-0.1*	0.1*	0.1*	0.0	-0.2*	-0.1*	-0.2*	0.1*	-0.6*	-05*	1.0

*statistically significant at the 5% margin; and **statistically significant at the 1% margin.

Appendix 5: Variance Inflation Factor (VIF) for the second stage regression

This table presents a Variance Inflation Factors (VIF) of key variables of interest for the sample of firms included in our sample. The sample covers for all control variables for the period of 1985 to 2012. All variables are defined in Appendix 1.

Variable	VIF	1/VIF
IMR	5.03	0.19869
FRIENDLY	3.6	0.277558
ACA	3.03	0.330141
TACOUNT	2.51	0.398885
TECHBIDDER	2.27	0.441315
TECHTARGET	2.11	0.47386
SIZEBLOG	1.9	0.525704
ALLCASH	1.87	0.535127
SIZETLOG	1.77	0.566403
SARBANES	1.62	0.6191
AACOUNT	1.54	0.648282
FINCRISIS	1.43	0.697379
INTCOVBIDDER	1.37	0.728218
RELATED	1.26	0.792108
TENDEROFFER	1.26	0.794913
BIDCOUNT	1.18	0.85006
COMPLETION	1.13	0.885101
MAACTIVITY	1.1	0.907821
FCTPREMIUM	1.05	0.952624
DEBTRATIO	1.04	0.962816
PREMIUM	1.01	0.986312
Mean	1.86	

Appendix 6: Variable Definition- Accrual-based EM and Real EM Activities Around Corporate Reorganization and Restructuring

Dependent variables used in this study

Variable	Variable Definition	Source
Measures of earnings management		
TOTAL EM	Earnings management proxy calculated based on Jones (1999) model and Roychowdhury (2006). EM is calculated based on whether a firm is classified as an earning management firm-year observation or not. EM takes the value of 1 if either of the real earnings management activities aggregate proxies either (RM_1 or RM_2) or discretionary accruals is above the industry-year median following the method by Zang (2012) and Cohen and Zarowin (2010). Discretionary accruals (DA) are estimated using the cross-sectional Jones (1991) model. Abnormal cash from operations are estimated as the deviations from the predicted values from the following industry-year regression: $$\frac{CFO_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta\, SALES_{i,t}}{Assets_{i,t-1}} + \varepsilon_{it}$$ where OCF is cash flow from operations (Compustat data item 308 minus Compustat data item 124); SALES are annual sales revenues (Compustat data item 12) and Assets are total assets (Compustat data item 6). Abnormal production costs are estimated as the deviations from the predicted values from the following industry-year regression: $$\frac{PROD_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta\, SALES_{i,t}}{Assets_{i,t-1}} + k_4 \frac{\Delta\, SALES_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{it}$$ where PROD are production costs, defined as the sum of costs of goods sold (Compustat data item 41) and change in inventory during the year (Compustat data item 3). Abnormal discretionary expenses are estimated as the deviations from the predicted values from the following industry-year regression: $$\frac{DISX_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{it}$$ where DISX are discretionary expenses during the year, and are defined as the sum of advertizing expenses (Compustat data item 45), R&D expenses (Compustat data item 46) and SGandA (Compustat data item 189).	Derived
RM_1	Following the method by Zang (2012) and Cohen and Zarawin (2010). RM_1= abnormal discretionary expenses X (-1) + abnormal production costs RM_1 takes the value of 1 if the figure is lower than the industry-year median RM_1 and 0 if otherwise.	Derived
RM_2	Following the method by Zang (2012) and Cohen and Zarawin (2010).	Derived

	RM_2= abnormal cash flows from operations X (-1) + abnormal discretionary expenditures X (-1) RM_2 takes the value of 1 if the figure is lower than the industry-year median RM_2 and 0 if otherwise.	
Measures of performance		
ΔROA	ROA is return on assets and is defined as income before extraordinary items divided by beginning of period total assets. The changes in ROA is calculated as the average differences in annual ROA after and before the restructuring	Compustat and Derived
CARS	Cumulative abnormal returns of the parent target for the three-day window events (-2,0), (-1,+1) and (0,+3) with day 0 being the restructuring announcement day.	Eventus
BHRS	BHRs is the buy-and-hold retrun (BHRs) for event window (1,+12), (1,+24), and (1,+36) for market model and Fama-French three- factor and momentum model event window (1,+12), (1,+24), and (1,+36).	Eventus
BHARS	BHARs is the buy-and-hold abnormal return and are calculated by taking the different between the BHRs of market model and BHRs of Fama-French three- factor and momentum model for the event window (1,+12), (1,+24), and (1,+36).	Eventus and Derived
$SDAR_{post}$	Standard deviation of monthly annual return of firms for t+1 to +3	Eventus

Explanatory Variables	Variable Definition	Source
SOX	A dummy variable equals to 1 if the year is 2002 (post-Sarbanes-Oxley Act) and 0 if otherwise	Derived
OPTION	Option represents the Black-Scholes value of option compensation as a proportion of total compensation received by the CEO and the CFO of a firm	Execucomp
BONUS	Bonus is the average bonus compensation as a proportion of total compensation received by the CEO and the CFO of a firm	Execucomp
SHARES	Shares, is the weighted average number of common shares outstanding at the beginning of the year, before the restructuring	Execucomp
MKT_CAP	Mkt_Cap is market value of equity and is calculated as the closing price at fiscal year-end times the number of shares outstanding at fiscal year-end	Compustat
B_M	B_M is the book-to-market ratio, where the book value of common equity, is divided by market value of equity	Compustat
HAB_BEAT	Hab_Beat is the frequency of meeting/beating analysts' earnings forecasts in the past four quarters of the announcement	IBES
ANALYST	Analyst is the number of analysts following the firm	IBES
LEVERAGE	Leverage is the sum of short term and long term debt divided by average total assets	Compustat
INDUSTRY CONC	Industry Conc is the sum of the largest four sales divided by the sum of sales in a given industry	Compustat
NDUSTRY ROA	Industry ROA is the average return on assets in a given industry	Compustat
INDUSTRY LEVERAGE	Industry Leverage is the average leverage ratio in the firms industry	Compustat

INDUSRTY M_B	Industry M_B is the market-to-book ratio in a given industry	Compustat
IMR	IMR is the inverse mills ratio calculated from the Probit regression in the first-stage of Heckman Selection Regression.	Derived

Source: Compiled by author from data obtained from Compustat, CRSP, and Thomson One Database

Appendix 7: Descriptive statistics for sample firms conducting carve-out, sell-off, spin-off and divestiture during 1985-2015.

Panel A: Size characteristics

Type	Number of Obs	Total assets ($ thousand)	Market value ($ thousand)	Book-to-market
Carve-out				
Mean	1396	$2,977.420	$3476.870	0.402
Median	1396	$720.906	$824.463	0.346
Std. dev	1396	$11222.620	$11091.400	0.707
Sell-off				
Mean	6990	$14454.920	$10875.780	0.453
Median	6990	$1978.650	$1442.860	0.471
Std. dev	6990	$71147.150	$34967.280	3.594
Spin-off				
Mean	385	$8978.210	$7677.940	0.460
Median	385	$1741.280	$1807.360	0.402
Std. dev	385	$26709.390	$18927.360	0.437
Divestiture				
Mean	1724	$31748.610	$10721.480	0.519
Median	1724	$1622.930	$1202.430	0.446
Std. dev	1724	$168151.150	$32176.880	0.595

Panel B – Year Distribution Based on the Year of Restructuring or Reorganization

	Carve-out		Sell-off		Spin-off		Divestiture	
Year	N	%	N	%	N	%	N	%
1985	5	0.36	164	2.35	13	3.38	25	1.45
1986	6	0.43	222	3.18	10	2.60	20	1.16
1987	6	0.43	192	2.75	9	2.34	27	1.57
1988	7	0.50	184	2.63	14	3.64	32	1.86
1989	7	0.50	213	3.05	8	2.08	42	2.44
1990	3	0.21	204	2.92	14	3.64	49	2.84
1991	16	1.15	182	2.60	4	1.04	59	3.42
1992	19	1.36	242	3.46	15	3.90	68	3.94
1993	24	1.72	237	3.39	18	4.68	69	4.00
1994	14	1.00	278	3.98	11	2.86	69	4.00
1995	21	1.50	290	4.15	20	5.19	80	4.64
1996	27	1.93	353	5.05	17	4.42	85	4.93
1997	38	2.72	321	4.59	25	6.49	85	4.93
1998	42	3.01	339	4.85	23	5.97	89	5.16
1999	26	1.86	355	5.08	25	6.49	76	4.41
2000	51	3.65	273	3.91	27	7.01	74	4.29
2001	117	8.38	245	3.51	8	2.08	46	2.67
2002	91	6.52	261	3.73	10	2.60	56	3.25
2003	203	14.54	304	4.35	13	3.38	67	3.89
2004	123	8.81	311	4.45	9	2.34	60	3.48
2005	82	5.87	291	4.16	10	2.60	82	4.76
2006	93	6.66	282	4.03	7	1.82	71	4.12
2007	83	5.95	269	3.85	19	4.94	73	4.23
2008	60	4.30	228	3.26	16	4.16	80	4.64
2009	59	4.23	213	3.05	9	2.34	56	3.25
2010	65	4.66	185	2.65	5	1.30	53	3.07
2011	64	4.58	164	2.35	16	4.16	66	3.83
2012	44	3.15	188	2.69	10	2.60	65	3.77

Total	1396	100.00	6990	100.00	385	100.00	1724	100.00

Notes to Appendix 7: Total assets are at the beginning of the period of total assets (Compustat data item #6); Market value refers to market value of equity and is calculated as the closing price at fiscal year-end, multiplied by the number of shares outstanding at fiscal year-end (Compustat annual data item #199 times Compustat annual Data item #25); book-to-market ratio, where the book value of common equity (Compustat annual data item #60) is divided by market value of equity (calculated as the closing price at fiscal year-end multiplied by the number of shares outstanding at fiscal year-end (Compustat annual Data item #199 times Compustat annual Data item #25)).

Source: Compiled by author from data obtained from Compustat and Thomson One Database

Appendix 8: Accrual-based earnings management proxies around carve-out, sell-off, spin-off and divestiture

Panel A: Accrual-based and real earnings management proxies around carve-out.							
Year	-3	-2	-1	0	+1	+2	+3
Discretionary accruals	-0.081***	-0.086***	-0.073***	-0.080***	-0.097***	-0.112***	-0.095***
Abnormal cash flows from operations	-0.058***	-0.100***	-0.086***	-0.057***	-0.072***	-0.063***	-0.072***
Abnormal production costs	0.089***	0.074***	0.090***	557.300***	0.089***	0.102***	0.082***
Abnormal discretionary expenses	0.179***	0.210***	0.189***	0.196***	0.220***	0.245***	0.235***
Panel B: Accrual-based and real earnings management proxies around sell-off.							
Year	-3	-2	-1	0	+1	+2	+3
Discretionary accruals	-0.033***	-0.053***	-0.069***	-0.058***	-0.060***	-0.105***	-0.070***
Abnormal cash flows from operations	-0.031***	-0.036***	-0.024***	-0.015***	-0.014***	0.040***	0.010***
Abnormal production costs	0.135***	0.126***	0.140***	2564.058***	0.104***	0.123***	0.105***
Abnormal discretionary expenses	0.103***	0.123***	0.142***	0.121***	0.133***	0.138***	0.142***
Panel C: Accrual-based and real earnings management proxies around spin-off.							
Year	-3	-2	-1	0	+1	+2	+3
Discretionary accruals	-0.008***	-0.022***	-0.079***	-0.065***	-0.079***	-0.105***	-0.070***
Abnormal cash flows from operations	-0.030***	-0.021**	-0.016	-0.012	-0.016	0.046***	0.038***
Abnormal production costs	0.054***	-0.021**	0.144***	1992.674***	0.059**	0.121***	0.076***
Abnormal discretionary expenses	0.096***	0.133***	0.216***	0.148***	0.157***	0.144***	0.139***
Panel D: Accrual-based and real earnings management proxies around divestiture.							
Year	-3	-2	-1	0	+1	+2	+3
Discretionary accruals	-0.029***	-0.042***	-0.061***	-0.042***	-0.052***	-0.102***	-0.076***
Abnormal cash flows from operations	-0.019***	-0.020***	-0.016***	-0.013***	-0.009***	0.028***	0.011**
Abnormal production costs	0.101***	0.084***	0.131***	2245.253***	0.082***	0.135***	0.086***
Abnormal discretionary expenses	0.070***	0.100***	0.124***	0.101***	0.099***	0.110***	0.121***

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Notes to Appendix 8: This table reports time series of accrual-based and real earnings management proxies from year -3 to year +3 relative to the carve-out, sell-off, spin-off and divestiture (year 0). Discretionary accruals are estimated using the cross-sectional Jones' (1991) model. Abnormal cash from operations are estimated as the deviations from the predicted values from the following industry year regression:

$$\frac{CFO_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta\, SALES_{i,t}}{Assets_{i,t-1}} + \varepsilon_{it}$$

where OCF is cash flow from operations (Compustat data item #308 minus Compustat data item #124); SALES are annual sales revenues (Compustat data item #12) and Assets are total assets (Compustat data item #6). Abnormal production costs are estimated as the deviations from the predicted values from the following industry year regression:

$$\frac{PROD_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta\, SALES_{i,t}}{Assets_{i,t-1}} + k_4 \frac{\Delta\, SALES_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{it}$$

where PROD are production costs, defined as the sum of costs of goods sold (Compustat data item #41) and change in inventory during the year (Compustat data item #3). Abnormal discretionary expenses are estimated as the deviations from the predicted values from the following industry-year regression:

$$\frac{DISX_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{SALES_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{it}$$

where DISX are discretionary expenses during the year, and are defined as the sum of advertizing expenses (Compustat data item #45), R&D expenses (Compustat data item #46) and SG&A (Compustat data item #189).

Source: Compiled by author from data obtained from Compustat Database

Appendix 9: Bidders' changes in ROA (ΔROA)

This table reports the univariate analysis of differences in means, t-test and difference in medians, Wilcoxon test. The changes in ROA are calculated as the average differences in annual ROA after and before the restructuring. EM is calculated based on whether a firm is classified as an earning management firm year observation or not. It is indicator variable that gets the value of 1 if either of the real earnings management activities aggregate proxies either (RM_1 or RM_2) or discretionary accruals is above the industry year median following the method by Cohen and Zarowin (2010).

Panel A Carve-out						
	Firms having EM below median industry-year EM (N= 117)		Firms having EM above median industry-year EM (N= 1200)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
ΔROA	Mean	Median	Mean	Median	Mean	Median
Average change in ROA between post and pre-restructuring	0.050 (1.595)	0.016 (9.500*)	0.006 (0.153)	0.005 (13.000)	0.044 (0.331)	0.011 (1.043)
Panel B Sell-off						
	Firms having EM below median industry-year EM (N= 555)		Firms having EM above median industry-year EM (N= 5936)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
ΔROA	Mean	Median	Mean	Median	Mean	Median
Average change in ROA between post and pre-restructuring	-0.037 (-0.761)	-0.005 (-13.500)	-0.012 (-1.112)	0.007 (178.000***)	-0.026 (-0.694)	-0.012 (-2.331**)
Panel C Spin-off						
	Firms having EM below median industry-year EM (N= 39)		Firms having EM above median industry-year EM (N= 330)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
ΔROA	Mean	Median	Mean	Median	Mean	Median
Average change in ROA between post and pre-restructuring	-0.651 (-0.968)	-0.017 (-1.500)	0.686 (1.016)	0.008 (11.000)	-1.337 (-0.675)	-0.025 (-0.134)
Panel D Divestiture						
	Firms having EM below median industry-year EM (N= 140)		Firms having EM above median industry-year EM (N= 1531)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
ΔROA	Mean	Median	Mean	Median	Mean	Median
Average change in ROA between post and pre-restructuring	-0.008 (-0.708)	0.000 (0.000)	-0.000 (-0.078)	0.001 (7.500)	-0.007 (-0.202)	-0.001 (-0.551)

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Source: Compiled by author from data obtained from Compustat Database

Appendix 10: Correlation matrix for the independent variables in probit regression (first-stage)

This table presents a Pearson correlation matrix of key variables of interest for the sample of firms included in our sample. The sample covers for all independent variables for the period of 1985 to 2015. All variables are defined in Appendix 6.

Panel A: Carve-Out										
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
ROA	**1**	1								
OPTION	**2**	-0.183**	1							
BONUS	**3**	-0.113**	0.184**	1						
SHARES	**4**	-0.024	0.094**	0.099**	1					
MKT_CAP	**5**	0.173**	0.091**	0.143**	0.786**	1				
B_M	**6**	-0.198**	-0.039	-0.012	-0.075*	-0.198**	1			
HAB_BEAT	**7**	0.041	0.020	0.104**	0.153**	0.235**	-0.085**	1		
ANALYST	**8**	0.018	0.066*	0.012	0.521**	0.496**	-0.008	0.191**	1	
LEVERAGE	**9**	-0.038	0.055	-0.050	0.087**	-0.053	-0.187**	-0.003	0.030	
Panel B: Sell-off										
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
ROA	**1**	1								
OPTION	**2**	-0.006	1							
BONUS	**3**	0.026	0.084**	1						
SHARES	**4**	0.062**	0.087**	0.043**	1					
MKT_CAP	**5**	0.155**	0.074**	0.045**	0.915**	1				
B_M	**6**	-0.016	-0.030*	0.038*	-0.175**	-0.199**	1			
HAB_BEAT	**7**	0.056**	0.000	0.051**	0.174**	0.215**	-0.104**	1		
ANALYST	**8**	0.045**	0.056**	0.019	0.545**	0.534**	-0.116**	0.262**	1	
LEVERAGE	**9**	-0.026	-0.034*	-0.032*	0.036*	-0.039**	-0.118**	-0.061**	-0.017	1

Panel c: Spin-off

		1	2	3	4	5	6	7	8	9
ROA	**1**	1								
OPTION	**2**	0.013	1							
BONUS	**3**	0.112	0.131*	1						
SHARES	**4**	0.125*	0.144*	0.017	1					
MKT_CAP	**5**	0.218**	0.119*	0.095	0.925**	1				
B_M	**6**	0.017	-0.045	-0.105	-0.061	-0.069	1			
HAB_BEAT	**7**	0.026	-0.043	-0.001	0.068	0.121*	-0.044	1		
ANALYST	**8**	-0.001	0.031	0.017	0.386**	0.414**	-0.047	0.153*	1	
LEVERAGE	**9**	0.054	-0.068	0.003	0.045	-0.008	-0.504**	-0.032	0.060	1

Panel D: Divestiture

		1	2	3	4	5	6	7
ROA	**1**	1						
OPTION	**2**	0.002	1					
SHARES	**3**	0.014	0.015	1				
B_M	**4**	-0.219**	-0.0064	-0.113**	1			
HAB_BEAT	**5**	0.014	0.002	0.141**	-0.077*	1		
ANALYST	**6**	0.006	0.002	0.499**	-0.056	0.172**	1	
LEVERAGE	**7**	0.038	0.024	0.071*	-0.104**	-0.034	0.020	1

*statistically significant at the 5% margin; **statistically significant at the 1% margin.

Appendix 11: Variance Inflation Factor (VIF) for the first stage regression

This table presents a Variance Inflation Factors (VIF) of key variables of interest for the sample of firms included in our sample. The sample covers for all independent variables for the period of 2000 to 2015. All variables are defined in Appendix 6.

Variable	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF	VIF	1/VIF
MKT_CAP	3.41	0.293595	6.94	0.144035	8.60	0.116285		
SHARES	3.16	0.316008	6.83	0.146476	8.01	0.124813	1.36	0.737402
ANALYST	1.45	0.690722	1.49	0.669165	1.25	0.802537	1.35	0.74013
ROA	1.20	0.835506	1.07	0.935664	1.13	0.883219	1.05	0.951467
B_M	1.16	0.865561	1.07	0.935281	1.41	0.711315	1.08	0.928042
LEVERAGE	1.12	0.894374	1.06	0.944194	1.45	0.688294	1.02	0.981957
BONUS	1.08	0.922916	1.01	0.985806	1.09	0.919095		
OPTION	1.08	0.923071	1.02	0.982840	1.06	0.945752	1.00	0.999192
HAB_BEAT	1.08	0.923297	1.10	0.907519	1.05	0.951989	1.04	0.960418
Mean	1.64		2.40		2.78		1.13	

Appendix 12: Bidders' announcement period cumulative abnormal returns (CARs)

This table reports the univariate analysis of differences in means, t-test and difference in medians, Wilcoxon test. CARs is the cumulative abnormal return (CARs) for 3-day event window (-2,0), (-1, +1) and (0,+3) for market model and Fama-French three-factor and momentum model for the 3-day event window (-2,0), (-1, +1) and (0,+3). EM is calculated based on whether a firm is classified as an earning management firm year observation or not. It is indicator variable that gets the value of 1 if either of the real earnings management activities aggregate proxies either (RM_1 or RM_2) or discretionary accruals is above the industry year median following the method by Cohen and Zarowin (2010). The sample covers for all control variables for the period of 1985 to 2015. All variables are defined in Appendix 6.

Panel A Carve-out							
		Firms having EM below median industry-year EM (N= 122)		Firms having EM above median industry-year EM (N= 1255)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
CAR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
Market Model	(-2,0)	-4.020% (-5.379***)	-4.396% (-27***)	-2.320% (-11.005***)	-1.944% (-162.5***)	-1.700% (-2.37**)	-2.452% (-2.759***)
	(-1,+1)	-3.310% (-4.533***)	-3.171% (-27***)	-2.330% (-7.618***)	-2.306% (-212.5***)	-0.979% (-0.97)	-0.865% (-1.022)
	(0,+3)	-2.390% (-3.141***)	-2.285% (-18***)	-1.420% (-4.544***)	-1.539% (-161.5***)	-0.966% (-0.94)	-0.746% (-0.647)
Fama-French three- factor and momentum model	(-2,0)	0.091% (4.974***)	0.082% (23***)	0.101% (13.396***)	0.086% (215.5***)	-0.010% (-0.39)	-0.004% (-0.159)
	(-1,+1)	0.091% (23***)	0.082% (23***)	0.101% (214***)	0.086% (214***)	-0.009% (-0.38)	-0.004% (-0.149)
	(0,+3)	0.091% (4.974***)	0.082% (23***)	0.101% (13.396***)	0.086% (215.5***)	-0.010% (-0.39)	-0.004% (-0.159)
Panel B Sell-off							
		Firms having EM below median industry-year EM (N= 256)		Firms having EM above median industry-year EM (N= 3068)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
CAR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
Market Model	(-2,0)	-0.892% (-2.442**)	-0.255% (-12)	-0.555% (-4.792***)	-0.254% (-73***)	-0.337% (-0.81)	-0.001% (-1.101)
	(-1,+1)	-1.140% (-2.864***)	-0.927% (-28***)	-0.240% (-2.052**)	-0.372% (-164***)	-0.899% (-2.13**)	-0.555% (-1.604)
	(0,+3)	-0.697% (-1.683*)	-0.791% (-26***)	0.147% (1.283)	-0.258% (-99***)	-0.844% (-2.04**)	-0.533% (-1.960*)
Fama-French three- factor and momentum model	(-2,0)	0.072% (6.845***)	0.061% (42.5***)	0.071% (23.505***)	0.071% (666.5***)	0.002% (0.13)	-0.010% (-1.076)
	(-1,+1)	0.072% (6.845***)	0.061% (42.5***)	0.071% (23.505***)	0.071% (666.5***)	0.002% (0.13)	-0.010% (-1.076)
	(0,+3)	0.072% (6.845***)	0.061% (42.5***)	0.071% (23.505***)	0.071% (666.5***)	0.002% (0.13)	-0.010% (-1.076)
Panel C Spin-off							
		Firms having EM below median industry-year EM (N= 17)		Firms having EM above median industry-year EM (N= 173)		Tests of differences between firms having EM below median industry-year EM and	

						firms having EM above median industry-year EM	
CAR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
Market Model	(-2,0)	-0.570% (-0.495)	-1.200% (-0.5)	0.793% (1.822*)	-0.133% (-1.5)	-1.360% (-0.95)	-1.067% (-0.612)
	(-1,+1)	0.674% (0.601)	2.809% (2.5)	1.580% (3.736***)	0.802% (10.5)	-0.909% (-0.65)	2.007% (0.021)
	(0,+3)	1.070% (0.873)	0.053% (0.5)	1.010% (2.061**)	0.053% (3.5)	0.061% (0.04)	0.000% (0.465)
Fama-French three- factor and momentum model	(-2,0)	0.047% (2.232**)	0.051% (2.5)	0.075% (7.582***)	0.082% (44***)	-0.027% (-0.85)	-0.031% (-1.248)
	(-1,+1)	0.047% (2.232**)	0.051% (2.5)	0.075% (7.582***)	0.082% (44***)	-0.027% (-0.85)	-0.031% (-1.248)
	(0,+3)	0.047% (2.232**)	0.051% (2.5)	0.075% (7.582***)	0.082% (44***)	-0.027% (-0.85)	-0.031% (-1.248)
Panel D Divestiture							
		Firms having EM below median industry-year EM (N= 84)		Firms having EM above median industry-year EM (N= 1017)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
CAR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
Market Model	(-2,0)	-0.739% (-0.779)	-0.386% (-3)	0.815% (3.692***)	0.358% (58.5***)	-1.550% (-1.91*)	-0.744% (-3.011***)
	(-1,+1)	-0.847% (-0.757)	-1.625% (-10**)	0.862% (3.603***)	0.308% (26.5)	-1.710% (-1.92*)	-1.933% (-2.989***)
	(0,+3)	0.681% (0.568)	-0.310% (-4)	1.230% (5.005***)	0.343% (39.5**)	-0.545% (-0.59)	-0.653% (-0.389)
Fama-French three- factor and momentum model	(-2,0)	0.125% (5.298***)	0.076% (18***)	0.081% (13.207***)	0.076% (190***)	0.044% (1.96*)	0.000% (1.088)
	(-1,+1)	0.125% (5.298***)	0.076% (18***)	0.081% (13.207***)	0.076% (190***)	0.044% (1.96*)	0.000% (1.088)
	(0,+3)	0.125% (5.298***)	0.076% (18***)	0.081% (13.207***)	0.076% (190***)	0.044% (1.96*)	0.000% (1.088)

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Source: Compiled by author from data obtained from CRSP and COMPUSTAT Database

Appendix 13: Bidders' buy-and-hold abnormal returns (BHARs)

This table reports the univariate analysis of differences in means, t-test and difference in medians, Wilcoxon test. BHR is the buy-and-hold return for event window (0,+12), (1,+24), and (0,+36) for market model and Fama-French three-factor and momentum model event window (0,+12), (1,+24), and (1,+36). BHAR is the buy-and-hold abnormal return, and are calculated by taking the difference between the BHRs of market model and BHRs of Fama-French three-factor and momentum model for the event window (0, +12), (1,+24), and (1,+36). EM is calculated based on whether a firm is classified as an earnings management firm year observation or not. It is indicator variable that gets the value of 1 if either of the real earnings management activities aggregate proxies either (RM_1 or RM_2), or if discretionary accruals is above the industry year median following the method by Cohen and Zarowin (2010). The sample covers for all control variables for the period of 1985 to 2015. All variables are defined in Appendix 6.

Panel A Carve-out							
		Firms having EM below median industry-year EM (N= 122)		Firms having EM above median industry-year EM (N= 1248)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
BHR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
Market Model(MM	(1,+12) months	-28.500% (-3.393***)	-25.087% (-17***)	-8.910% (-3.746***)	-6.884% (-82***)	-19.590% (-2.43**)	-18.203% (-2.282**)
	(1,+24) months	-59.570% (-4.636***)	-43.323% (-16)	-13.600% (-4.049***)	-10.712% (-75***)	-45.980% (-4.01***)	-32.611% (-3.268***)
	(0,+36) months	-70.900% (-3.740***)	-45.292% (-11*)	-23.090% (-5.205***)	-14.834% (-78***)	-47.820% (-3.11***)	-30.458% (-2.205**)
Fama-French three- factor and momentum model (FFMM)	(1,+12) months	1.470% (4.190***)	1.188% (17***)	1.710% (16.353***)	1.502% (275***)	-0.242% (-0.69)	-0.314% (-1.000)
	(1,+24) months	1.570% (3.668***)	1.411% (17***)	2.000% (14.530***)	1.744% (281***)	-0.433% (-0.94)	-0.333% (-1.584)
	(0,+36) months	1.570% (3.668***)	1.411% (17***)	2.000% (17.530***)	1.744% (281***)	-0.433% (-0.94)	-0.333% (-1.584)
BHAR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
BHR (MM) minus BHR(FFMM)	(1,+12) months	-29.970% (-3.516***)	-27.156% (-17***)	-10.620% (-4.416***)	-8.662% (-100***)	-19.350% (-2.38**)	-18.494% (-2.187**)
	(1,+24) months	-61.140% (-4.691***)	-45.545% (-15***)	-15.600% (-4.587***)	-13.224% (-82***)	-45.540% (-3.92***)	-32.321% (-3.158***)
	(1,+36) months	-72.48% (-3.785***)	-48.782% (-11*)	-25.090% (-5.599***)	-16.436% (-80***)	-47.400% (-3.05***)	-32.346% (-2.154**)
Panel B Sell-off							
		Firms having EM below median industry-year EM (N= 256)		Firms having EM above median industry-year EM (N= 3028)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
BHR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
Market Model	(0,+12) months	-2.480% (-0.763)	1.553% (4.5)	-4.210% (-4.866***)	-3.068% (-84***)	1.730% (0.55)	4.621% (0.859)
	(0,+24) months	-7.450% (-1.437)	-7.697% (-8.5)	-6.810% (-4.832***)	-2.898% (-69**)	-0.634% (-0.12)	-4.799% (-0.495)
	(0,+36) months	-10.910% (-1.549)	-13.975% (-9.5)	-7.880% (-4.441***)	-3.942% (-79***)	-3.030% (-0.47)	-10.033% (-0.938)
Fama-French three- factor	(0,+12) months	1.290% (8.034***)	1.207% (74.5***)	1.500% (31.615***)	1.339% (860***)	-0.209% (-1.23)	-0.132% (-0.730)

and momentum model							
	(0,+24)	1.400%	1.034%	1.400%	1.036%	0.004%	-0.002%
	months	(7.000***)	(63.5***)	(26.943***)	(720***)	(0.02)	(-0.113)
	(0,+36)	1.400%	1.034%	1.400%	1.036%	0.004%	-0.002%
	months	(7.000***)	(63.5***)	(26.943***)	(720***)	(0.02)	(-0.113)
BHAR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
BHR (MM) minus BHR(FFMM)	(0,+12)	-3.770%	0.306%	-5.710%	-3.800%	1.940%	4.106%
	months	(-1.146)	(3.5)	(-6.521***)	(-126***)	(0.61)	(0.830)
	(0,+24)	-8.850%	-7.056%	-8.210%	-4.138%	-0.638%	-2.918%
	months	(-1.683*)	(-10.5)	(-5.753***)	(96***)	(-0.12)	(-0.762)
	(0,+36)	-12.310%	-13.606%	-9.280%	-5.610%	-3.030%	-7.996%
	months	(-1.729*)	(-9.5)	(-5.171***)	(-90***)	(-0.46)	(-0.915)
Panel C Spin-off							
		Firms having EM below median industry-year EM (N= 122)		Firms having EM above median industry-year EM (N= 1255)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
BHR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
Market Model	(0,+12)	24.060%	9.774%	-5.900%	-3.592%	29.960%	13.366%
	months	(2.047*)	(2.5)	(-1.584)	(-7.000)	(2.43**)	(1.939*)
	(0,+24)	28.770%	16.949%	-11.650%	-10.913%	40.420%	27.862%
	months	(1.389)	(0.5)	(-1.908*)	(-12*)	(1.98**)	(1.614)
	(0,+36)	8.230%	11.381%	-24.490%	-23.673%	32.720%	35.054%
	months	(0.407)	(2.5)	(-3.260***)	(-16**)	(1.33)	(1.657*)
Fama-French three- factor and momentum model	(0,+12)	1.340%	1.137%	1.560%	1.284%	-0.221%	-0.147%
	months	(4.014***)	(7.5***)	98.330***)	(48***)	(-0.37)	(-0.033)
	(0,+24)	1.380%	1.036%	1.340%	1.285%	0.045%	-0.249%
	months	(5.005***)	(8.5***)	(7.207***)	(45***)	(0.07)	(-0.085)
	(0,+36)	1.380%	1.036%	1.340%	1.285%	0.045%	-0.249%
	months	(5.005***)	(8.5***)	(7.207***)	(45***)	(0.07)	(-0.085)
BHAR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
BHR (MM) minus BHR(FFMM)	(0,+12)	22.710%	6.158%	-7.460%	-4.125%	30.180%	10.283%
	months	(1.923*)	92.5)	(-1.987**)	(-10)	(2.42**)	(1.934*)
	(0,+24)	27.390%	12.309%	-12.990%	-12.501%	40.380%	24.810%
	months	(1.316)	(0.5)	(-2.108**)	(-14**)	(1.96*)	(1.596)
	(0,+36)	6.850%	10.239%	-25.820%	-24.079%	32.670%	34.318%
	months	(0.338)	(2.5)	(-3.410***)	(-16**)	(1.32)	(1.633)
Panel D Divestiture							
		Firms having EM below median industry-year EM (N= 84)		Firms having EM above median industry-year EM (N= 1008)		Tests of differences between firms having EM below median industry-year EM and firms having EM above median industry-year EM	
BHR estimation method	Windows	Mean	Median	Mean	Median	Mean	Median
Market Model	(0,+12)	0.562%	4.916%	1.890%	3.293%	-1.330%	1.623%
	months	(0.092)	(9*)	(1.122)	(39**)	(-0.22)	(0.572)
	(0,+24)	-7.340%	12.449%	1.400%	5.788%	-8.740%	6.661%
	months	9-0.736)	(6)	(0.549)	(33*)	(-0.94)	(0.290)
	(0,+36)	-5.900%	11.316%	-3.260%	7.212%	-2.650%	4.104%
	months	(-0.476)	(6)	(-1.017)	(33**)	(-0.23)	(0.390)

Fama-French three- factor and momentum model	(0,+12) months	1.810% (5.774***)	1.284% (23***)	1.590% (20.059***)	1.364% (292***)	0.221% (0.76)	-0.080% (-0.206)
	(0,+24) months	1.950% (4.654***)	1.146% (20***)	1.570% (16.256***)	1.343% (246***)	0.378% (1.06)	-0.197% (-0.433)
	(0,+36) months	1.950% (4.654***)	1.146% (20***)	1.570% (16.256***)	1.343% (246***)	0.378% (1.06)	-0.197% (-0.433)
BHAR estimation method		Mean	Median	Mean	Median	Mean	Median
BHR (MM) minus BHR(FFMM)	Windows						
	(0,+12) months	-1.250% (-0.204)	3.504% (5)	0.299% (0.176)	1.647% (27*)	-1.550% (-0.25)	1.857% (0.585)
	(0,+24) months	-9.290% (-0.911)	12.471% (5)	-0.171% (-0.066)	5.164% (24)	-9.120% (-0.97)	7.307% (0.303)
	(0,+36) months	-7.850% (-0.623)	11.033% 96)	-4.830% (-1.495)	7.153% (29*)	-3.020% (-0.26)	3.880% (0.406)

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Source: Compiled by author from data obtained from Compustat and CRSP Database

Appendix 14: Results from OLS Regression of Changes in ROAs, CARs, BHARs and SDARs for Carve-out

This table presents the results of ordinary least squares regression of changes in ROAs, CARs, BHARs and SDARs for carve-out. The sample covers for all control variables for the period of 1985 to 2015. All variables are defined in Appendix 6.

Panel A Results from Multiple Regression of Changes in ROAs, and CARs for Carve-out

	ΔROA			**CARs (-2,0)**			**CARs (-1,+1)**		
	ΔROA	ΔROA	ΔROA	CARs (-2,0)	CARs (-2,0)	CARs (-2,0)	CARs (-1,+1)	CARs (-1,+1)	CARs (-1,+1)
DA	0.000			0.000***			0.000		
RM_1		-0.014*			-0.004			-0.001	
RM_2			-0.004			-0.002			-0.004
SOX	-0.060*	-0.058*	-0.058*	0.009	0.008	0.008	0.006	0.006	0.006
OPTION	-0.007***	-0.007***	-0.007***	0.000	0.000	0.000	0.001*	0.001*	0.001*
SHARES	0.137**	0.132**	0.136**	-0.029*	-0.029*	-0.027*	-0.036**	-0.036**	-0.036**
MKT_CAP	-0.080**	-0.078**	-0.080**	0.0278*	0.031**	0.030**	0.037**	0.038**	0.038**
B_M	-0.031	-0.031	-0.033	-0.017	-0.010	-0.012	-0.009	-0.008	-0.008
HAB_BEAT	-0.005	-0.006	-0.005	-0.004	-0.004	-0.004	-0.002	-0.002	-0.002
ANALYST	-0.039	-0.039	-0.040	0.008	0.006	0.006	0.018	0.017	0.017
LEVERAGE	0.449**	0.444**	0.448**	-0.062**	-0.058**	-0.058**	-0.058**	-0.057**	-0.057**
INDUSTRY CONC	15.570	15.320	15.460	0.425**	0.416**	0.381*	0.425**	0.427**	0.402*
INDUSTRY LEVERAGE	0.088	0.090	0.088	0.010	0.009	0.009	0.009	0.009	0.008
INDUSTRY ROA	0.297***	0.299***	0.296***	0.005	0.007	0.007	-0.003	-0.003	-0.004
IMDUSTRY M_B	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Constant	-0.017	-0.017	-0.016	-0.042	-0.052	-0.049	-0.078**	-0.080**	-0.080**
Observation	354	354	354	421	421	421	421	421	421
F-statistics	4.23	4.26	4.21	2.930	2.410	2.470	1.750	1.780	1.800
Prob > F	0.000	0.000	0.000	0.000	0.004	0.003	0.050	0.044	0.042
R-squared	0.379	0.382	0.378	0.067	0.056	0.051	0.064	0.065	0.066

Panel B Results from Multiple Regression of Changes in BHARs, and Post-SDARs for Carve-out

	BHAR (+1,+12)			**Post-SDARs**		
	BHAR (+1,+12)	BHAR (+1,+12)	BHAR (+1,+12)	Post-SDARs	Post-SDARs	Post-SDARs
DA	0.000			0.000		
RM_1		0.007			0.003	
RM_2			0.048*			0.001
SOX	-0.045	-0.045	-0.045	-0.032***	-0.031***	-0.032***
OPTION	-0.008***	-0.007***	-0.007***	0.001***	0.001***	0.001***
SHARES	0.142	0.145	0.149*	0.061***	0.062***	0.061***
MKT_CAP	0.136	0.132	0.126	-0.107***	-0.109***	-0.108***
B_M	0.031	0.028	0.029	-0.013	-0.015	-0.014
HAB_BEAT	0.012	0.012	0.012	0.001	0.001	0.001
ANALYST	-0.299***	-0.297***	-0.287***	0.018	0.019	0.018
LEVERAGE	0.411***	0.411***	0.405***	-0.077***	-0.077***	-0.078***
INDUSTRY CONC	-5.965***	-6.009***	-5.741***	-0.165	-0.180	-0.156
INDUSTRY LEVERAGE	0.208**	0.209**	0.213**	-0.008	-0.008	-0.008
INDUSTRY ROA	0.224***	0.224***	0.231***	0.005	0.004	0.004
IMDUSTRY M_B	0.000	0.000	0.000	-0.000*	-0.000**	-0.000*
Constant	-0.740***	-0.734***	-0.735***	0.439***	0.443***	0.440***
Observation	420	420	420	420	420	420
F-statistics	3.740	3.720	4.050	10.670	10.530	10.860
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.088	0.088	0.094	0.238	0.24	0.238

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Source: Compiled by author from data obtained from Compustat, CRSP, and Thomson One Database

Appendix 15: Results from OLS Regression of Changes in ROAs, CARs, BHARs and SDARs for Sell-off

This table presents the results of ordinary least squares regression of changes in ROAs, CARs, BHARs and SDARs for sell-off. The sample covers for all control variables for the period of 1985 to 2015. All variables are defined in Appendix 6.

Panel A Results from Multiple Regression of Changes in ROAs, and CARs for Sell-off

	ΔROA			**CARs (-2,0)**			**CARs (-1,+1)**		
	ΔROA	ΔROA	ΔROA	CARs (-2,0)	CARs (-2,0)	CARs (-2,0)	CARs (-1,+1)	CARs (-1,+1)	CARs (-1,+1)
DA	0.000			0.000			0.000		
RM_1		-0.002*			0.000**			0.000***	
RM_2			0.002***			-0.001			-0.001
SOX	0.028	0.027	0.033	0.002	0.002	0.002	0.006	0.006	0.006
OPTION	-0.000***	-0.000***	-0.000***	-0.000*	-0.000*	-0.000*	0.000	0.000	0.000
SHARES	0.100***	0.101***	0.076***	-0.031***	-0.031***	-0.031***	-0.039***	-0.039***	-0.039***
MKT_CAP	-0.104***	-0.106***	-0.084***	0.037***	0.037***	0.037***	0.041***	0.041***	0.041***
B_M	-0.107	-0.108	-0.100	0.005	0.005	0.005	-0.003	-0.003	-0.003
HAB_BEAT	-0.009	-0.010	-0.009	0.000	0.000	0.000	0.000	0.000	0.000
ANALYST	0.067	0.068	0.074	-0.020**	-0.020**	-0.020**	-0.010	-0.010	-0.010
LEVERAGE	-0.088	-0.088	-0.079	-0.009	-0.009	-0.010	-0.014	-0.014	-0.015
INDUSTRY CONC	-1.702	-1.676	-1.696	-0.036	-0.038	-0.036	-0.177	-0.181	-0.178
INDUSTRY LEVERAGE	0.025*	0.024*	0.026*	0.000	0.001	0.001	0.010	0.010*	0.010*
INDUSTRY ROA	0.075***	0.074***	0.071***	0.023***	0.023***	0.023***	0.021***	0.022***	0.022***
IMDUSTRY M_B	0.000	0.000	0.000	0.000	0.000	0.000	0.000***	0.000***	0.000***
Constant	0.173*	0.178*	0.135	-0.058***	-0.059***	-0.059***	-0.061***	-0.063***	-0.063***
Observation	1,677	1,677	1,677	1,077	1,077	1,077	1,077	1,077	1,077
Robust Standard Error	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistics	7.860	10.600	96.050	4.370	4.380	4.460	4.840	4.880	5.020
Prob > F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R-squared	0.009	0.009	0.012	0.062	0.062	0.063	0.073	0.074	0.074

Panel B Results from Multiple Regression of Changes in BHARs, and Post-SDARs for Sell-off

	BHAR (+1,+12)			**Post-SDARs**		
	BHAR (+1,+12)	BHAR (+1,+12)	BHAR (+1,+12)	Post-SDARs	Post-SDARs	Post-SDARs
DA	0.000			0.000		
RM_1		0.002***			0.000*	
RM_2			0.003			0.000
SOX	-0.007	-0.004	-0.006	-0.007**	-0.007**	-0.007**
OPTION	-0.003**	-0.003**	-0.003**	0.000	0.000	0.000
SHARES	-0.040	-0.046	-0.041	0.041***	0.041***	0.041***
MKT_CAP	0.118**	0.126**	0.119**	-0.073***	-0.073***	-0.073***
B_M	0.013	0.015	0.012	0.000	0.000	0.000
HAB_BEAT	-0.004	-0.004	-0.005	0.003**	0.003**	0.003**
ANALYST	-0.138**	-0.139**	-0.138**	0.040***	0.040***	0.040***
LEVERAGE	-0.190**	-0.192**	-0.187**	-0.030***	-0.030***	-0.030***
INDUSTRY CONC	3.836**	3.810**	3.840**	-0.343*	-0.347*	-0.342*
INDUSTRY LEVERAGE	0.072	0.073	0.069	0.016***	0.016***	0.016***
INDUSTRY ROA	0.015	0.018	0.014	0.005	0.005	0.005
IMDUSTRY M_B	0.000**	0.000**	0.000**	0.000	0.000	0.000
Constant	-0.268***	-0.280***	-0.266***	0.274***	0.274***	0.275***
Observation	1,067	1,067	1,067	1,882	1,882	1,882
Robust Standard Error	Yes	Yes	Yes	Yes	Yes	Yes
F-statistics	2.460	2.650	2.350	28.690	29.350	28.640
Prob > F	0.003	0.001	0.004	0.000	0.000	0.000
R-squared	0.027	0.027	0.027	0.145	0.145	0.145

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Source: Compiled by author from data obtained from Compustat, CRSP, and Thomson One Database

Appendix 16: Results from OLS Regression of Changes in ROAs, CARs, BHARs and SDARs for Spin-off

This table presents the results of ordinary least squares regression of changes in ROAs, CARs, BHARs and SDARs for spin-off. The sample covers for all control variables for the period of 1985 to 2015. All variables are defined in Appendix 6.

Panel A Results from Multiple Regression of Changes in ROAs, and CARs for Spin-off

	ΔROA			**CARs (-2,0)**			**CARs (-1,+1)**		
	ΔROA	ΔROA	ΔROA	CARs (-2,0)	CARs (-2,0)	CARs (-2,0)	CARs (-1,+1)	CARs (-1,+1)	CARs (-1,+1)
DA	-0.000*			0.000			0.000		
RM_1		0.000			0.000			0.001	
RM_2			0.002			-0.001			-0.003
SHARES	0.112	0.113	0.112	-0.003	-0.002	-0.002	-0.010	-0.003	-0.003
MKT_CAP	-0.091	-0.093	-0.092	-0.005	-0.006	-0.006	0.001	-0.003	-0.003
HAB_BEAT	0.002	0.002	0.002	-0.004	-0.004	-0.004	-0.001	-0.002	-0.001
INDUSTRY LEVERAGE	-0.046	-0.046	-0.046	0.001	0.001	0.001	-0.011	-0.011	-0.009
INDUSTRY M_B	0.003***	0.002**	0.002**	0.001	0.001	0.001	0.000	0.000	0.000
Constant	0.111	0.116	0.115	0.026	0.026	0.026	0.031	0.032	0.032
Observation	117	117	117	64	64	64	64	64	64
Robust Standard Error	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistics	1.720	1.210	1.230	0.320	0.340	0.280	0.770	0.370	0.330
Prob > F	0.123	0.304	0.294	0.923	0.915	0.943	0.593	0.893	0.920
R-squared	0.046	0.043	0.043	0.021	0.021	0.021	0.043	0.028	0.032

Panel B Results from Multiple Regression of Changes in BHARs, and Post-SDARs for Spin-off

	BHAR (+1,+12)			**Post-SDARs**		
	BHAR (+1, +12)	BHAR (+1, +12)	BHAR (+1, +12)	Post-SDARs	Post-SDARs	Post-SDARs
DA	0.000			-0.000*		
RM_1		-0.055***			-0.002	
RM_2			-0.085***			0.003
SHARES	-0.386	-0.456	-0.369	0.044	0.044	0.042
MKT_CAP	0.158	0.196	0.150	-0.057**	-0.058**	-0.057**
HAB_BEAT	0.038	0.024	0.044	-0.004	-0.003	-0.004
INDUSTRY LEVERAGE	-0.090	0.023	-0.047	-0.001	0.001	0.000
INDUSTRY M_B	-0.004	-0.004	-0.004	0.001	0.000	0.000
Constant	0.233	0.169	0.215	0.242***	0.245***	0.246***
Observation	62	62	62	110	110	110
Robust Standard Error	Yes	Yes	Yes	Yes	Yes	Yes
F-statistics	1.980	25.400	2.860	3.480	2.790	2.730
Prob > F	0.099	0.000	0.017	0.004	0.015	0.017
R-squared	0.099	0.262	0.151	0.109	0.103	0.103

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Source: Compiled by author from data obtained from Compustat, CRSP, and Thomson One Database

Appendix 17: Results from OLS Regression of Changes in ROAs, CARs, BHARs and SDARs for Divestiture

This table presents the results of ordinary least squares of changes in ROAs, CARs, BHARs and SDARs for divestitures. The sample covers for all control variables for the period of 1985 to 2015. All variables are defined in Appendix 6.

Panel A Results from Multiple Regression of Changes in ROAs, and CARs for Divestiture

	ΔROA			**CARs (-2,0)**			**CARs (-1,+1)**		
	ΔROA	ΔROA	ΔROA	CARs (-2,0)	CARs (-2,0)	CARs (-2,0)	CARs (-1,+1)	CARs (-1,+1)	CARs (-1,+1)
DA	0.000			-0.000***			-0.000***		
RM_1		-0.001*			0.000			0.000	
RM_2			0.001*			0.000			0.000
SOX	-0.035**	-0.036**	-0.035**	0.005	0.005	0.005	0.009	0.009	0.009
OPTION	0.010	0.010	0.010	-0.006	-0.005	-0.005	-0.002	-0.002	-0.002
SHARES	0.062*	0.063*	0.058	-0.072***	-0.075***	-0.076***	-0.072***	-0.076***	-0.077***
MKT_CAP	-0.024	-0.025	-0.023	0.064***	0.065***	0.065***	0.068***	0.069***	0.070***
B_M	0.043***	0.043***	0.042***	0.009	0.010	0.009	0.005	0.006	0.004
HAB_BEAT	-0.003	-0.003	-0.003	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003
ANALYST	-0.045*	-0.045*	-0.044	-0.008	-0.006	-0.006	-0.017	-0.015	-0.015
LEVERAGE	-0.073	-0.072	-0.072	0.025	0.025	0.024	0.046*	0.045*	0.045*
INDUSTRY CONCENTRATION	-0.595**	-0.586**	-0.584**	-0.332**	-0.315**	-0.309**	-0.410***	-0.387***	-0.383***
INDUSTRY LEVERAGE	-0.012	-0.013	-0.012	0.001	0.002	0.002	0.019	0.019*	0.019*
INDUSTRY ROA	0.093*	0.092*	0.093*	-0.017	-0.017	-0.017	-0.008	-0.008	-0.008
IMDUSTRY M_B	0.002	0.002	0.002	-0.002***	-0.002***	-0.002***	-0.001**	-0.001**	-0.001**
Constant	0.027	0.028	0.028	-0.062**	-0.063**	-0.061**	-0.085***	-0.084***	-0.084***
Observation	455	455	455	344	344	344	344	344	344
Robust Standard Error	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-statistics	3.390	3.950	3.750	6.160	2.570	2.450	6.850	2.740	2.760
Prob > F	0.000	0.000	0.000	0.000	0.002	0.004	0.000	0.001	0.001
R-squared	0.123	0.124	0.125	0.079	0.076	0.076	0.079	0.075	0.076

Panel B Results from Multiple Regression of Changes in BHARs, and Post-SDARs for Divestiture

	BHAR (+1,+12)			**Post-SDARs**		
	BHAR (+1,+12)	BHAR (+1,+12)	BHAR (+1,+12)	Post-SDARs	Post-SDARs	Post-SDARs
DA	0.000			0.000		
RM_1		0.000			0.000	
RM_2			0.002			0.001***
SOX	-0.075	-0.074	-0.075	-0.008	-0.008	-0.009
OPTION	-0.049**	-0.050**	-0.049**	0.0049*	0.005*	0.005*
SHARES	-0.054	-0.048	-0.058	0.056***	0.056***	0.051***
MKT_CAP	0.165*	0.163*	0.166*	-0.066***	-0.066***	-0.064***
B_M	0.016	0.014	0.003	0.013	0.013	0.009
HAB_BEAT	-0.020	-0.020	-0.021	0.005**	0.005**	0.004*
ANALYST	-0.184	-0.188	-0.184	-0.013	-0.013	-0.012
LEVERAGE	0.115	0.116	0.115	-0.047***	-0.047***	-0.047***
INDUSTRY CONC	-1.909**	-1.959**	-1.918**	-0.311***	-0.313***	-0.300***
INDUSTRY LEVERAGE	-0.009	-0.010	-0.009	0.014	0.014	0.014
INDUSTRY ROA	-0.035	-0.034	-0.036	0.021***	0.022***	0.021***
IMDUSTRY M_B	0.003	0.003	0.003	-0.001	-0.001	-0.001
Constant	-0.222	-0.224	-0.215	0.264***	0.263***	0.266***
Observation	343	343	343	513	513	513
Robust Standard Error	Yes	Yes	Yes	Yes	Yes	Yes
F-statistics	1.290	1.220	1.230	9.350	9.450	16.320
Prob > F	0.218	0.266	0.259	0.150	0.000	0.000
R-squared	0.044	0.044	0.046	0.150	0.150	0.177

*Represent significant at the 10% level. ** Represent significant at the 5% level. *** Represent significant at the 1% level.

Source: Compiled by author from data obtained from Compustat, CRSP, and Thomson One Database

Appendix 18: Variable Definition- The Effects of Pay Slice and Corporate Governance on Bank's Efficiency and Risk-Taking Behaviour

Variable	Variable Definition	Source
Measures of performance		
ROA	Return on assets. The ratio of net income to total assets.	Bankscope
EFFICIENCY	Efficiency score calculated using Stochastic frontier analysis.	Derived
LN(ZSCORE5)	The natural logarithm of the Z-score. The Z-score measure the distance from insolvency. $$Z_{i,t} = \frac{ROA_{i,t} + (\frac{E}{A})_{i,t}}{\sigma\ (ROA)_{i,t}}$$ Where ROA is return on assets, E/A denotes the equity to asset ratio and σ (ROA) is the standard deviation of return on assets. We use a five-year rolling time window rather than the full sample period, to compute the standard deviation of ROA to allow for time variation in the denominator of the Z-score.	Derived
LN(ZSCORE3)	The natural logarithm of the Z-score. The Z-score measure the distance from insolvency. $$Z_{i,t} = \frac{ROA_{i,t} + (\frac{E}{A})_{i,t}}{\sigma\ (ROA)_{i,t}}$$ Where ROA is return on assets, E/A denotes the equity to asset ratio and σ (ROA) is the standard deviation of return on assets. We use a three-year rolling time window rather than the full sample period, to compute the standard deviation of ROA to allow for time variation in the denominator of the Z-score.	
Explanatory Variables		
IOPr	Institutional ownership proportion (IOPr) is the percentage of firm I owned by institutions over a 5-year period (i.e., 20 quarters). The value of the coefficient reported is for IOPr × 100. Following Jafarinejad *et al.* (2015) and Elyasiani *et al.* (2010) $$IOPr = \frac{(\sum_{t=1}^{20} \sum_{j=1}^{j_t} p_{i,t}^{j})}{20}$$	Derived.
IOV	Institutional ownership volatility (IOVi) is measured as the average standard deviation of institutional shareholding proportions across all investors in a firm over a 5-year period (i.e., 20 quarters). Following Jafarinejad *et al.* (2015) and Elyasiani *et al.* (2010) $$IOV_i = \frac{(\sum_{t=1}^{j_t} \mathrm{Stdev}(p_{i,t}^{j})}{j_i}$$	Derived
L5IO	L5io is the number of shares held by the largest five institutional ownership.	Thomson Reuters
CEODUAL	A dummy variable equals to 1 if the CEO is also the chairman of the board. This variable is important as it serve as a proxy for the relative importance of the CEO to the firm (Adams, Almeida, and Ferreira, 2005)	Execucomp

BOARDSIZE	The logarithm of the number of board members.	ExecuComp
SOX	A dummy variable equals to 1 if the year is January 1-December 2014 (post-Sarbanes-Oxley Act) and 0 if otherwise	Derived
NEWCEO	A dummy variable is there any changes of CEO the last 12 months period equals to 1 and 0 if otherwise	Execucomp
CEOEXPERIENCE	Dummy variable of 1 if the tenure is more than seven years and 0 if otherwise. Following (Bebchuk et al., 2011) method. / Number of years.	Execucomp
TARP	An indicator variable would equal to 1 if the bank received funding from the Troubled Assets Relief Program and 0 otherwise	http://projects.propublica.org/bailout/list
DIRECTOR OWN	The percentage of shares owned by board of directors	Execucomp
LEVERAGE	Long term debt (data item 9) / Total Assets (data item 6)	Compustat
RETIRINGCEO	RETIRINGCEO is a dummy variable of 1 if the age of the CEO is more than 60 and 0 if otherwise	Execucomp
CEOGENDER	CEOGENDER is 1 if the CEO is a male and 0 if otherwise	Execucomp
CRISIS	Dfcrisis is a dummy variable of 1 if the period is 2007-2009 and 0 if otherwise	Derived
CPSIII	CEO current compensation divided by the current compensation of top four management team. CEO Compensation/ Top 4 executive following Pissaris, S. Jeffus, W. Gleason (2010)	Derived
CPSIV	CEO contingent compensation divided by total contingent compensation of top four management team. CEO Compensation/ Top 4 executive following Pissaris, S. Jeffus, W. Gleason (2010)	Derived
CPSI	Total CEO compensation divided by the total compensation of top five management team. The total compensation as measured by data item TDC1 from ExecuComp containing salary, bonus, other annual compensation, total value of restricted stock granted, Black and Scholes value of stock options granted, long-term incentive payouts, and all other total incentive compensation following the definition by Bebchuk *et al.* (2011)	Derived
CPSII	Ceo salary compensation divided by salary of total top five of management team. CEO pay/ Top Management Team following Carpenter and Sanders (2002) and Wade *et al.* (2006)	Derived
GEINDEX	It is the combination of two indexes, i.e., Entrenchment Index consists of six of the governance/shareholder rights provision. Eindex ranges between 0 and 6, where higher values indicate weaker shareholder rights or more retrenched management, and Governance Index (GIndex), Gompers, Ishii, and Metrick (2003), which is based on a broader set of 24 governance provisions. A high G-index value represents weak shareholder (or strong managerial) power. GEindex is the percentage of the scores of the combination of G-Index and E-Index.	RiskMetrik
TA	The proxy of firm size measured by logarithm of a total asset in the balance sheet.	Derived
CEOAGE	The logarithm of the age of the CEO.	Execucomp

ZSCORE5MEDIAN	Is the industry-year median of ln(zscore5)	Derived
ZSCORE3MEDIAN	Is the industry-year median of ln(zscore3)	Derived
EFFICIENCYMEDIAN	Is the industry-year median of SFA	Derived
SDARMEDIAN	Is the industry-year median of standard deviation of annual stock return	Derived
SDDAILYMEDIAN	Is the industry-year median of standard deviation of daily stock return	Derived
CFOISVP	Cfoisvp is a dummy variable of 1 if the CFO of the firm is one of the VPs.	Execucomp
NUMBEROFVPS	Numberofvps is the number of the vice presidents.	Execucomp

Source: Compiled by author from data obtained from Bankscope, Execucomp and Compustat

Appendix 19: List of Banks

No.	Bank Name
1	Affiliated Managers Group, Inc.
2	American Express Company
3	Anchor BanCorp Wisconsin Inc
4	Associated Banc-Corp.
5	Astoria Financial Corporation
6	BBandT Corporation
7	BBCN Bancorp, Inc
8	BBX Capital Corporation
9	Bancorpsouth, Inc.
10	Bank Mutual Corporation
11	Bank Of The Ozarks Inc
12	Bank of America Corporation
13	Bank of Hawaii Corporation
14	Bank of New York Mellon Corporation
15	Banner Corporation
16	BlackRock, Inc
17	BofI Holding Inc
18	Boston Private Financial Holdings Inc
19	Brookline Bancorp Inc
20	CIT Group, Inc
21	CME Group Inc
22	CVB Financial Corp
23	Capital One Financial Corporation
24	Cardinal Financial Corporation
25	Cascade Bancorp
26	Cathay General Bancorp Inc
27	Central Pacific Financial Corp.
28	Charles Schwab Corporation
29	Citigroup Inc
30	City Holding Company
31	City National Corporation
32	Columbia Banking System, Inc
33	Comerica Incorporated
34	Commerce Bancshares, Inc.
35	Community Bank System, Inc.
36	Cullen/Frost Bankers, Inc
37	Dime Community Bancshares, Inc
38	Discover Financial Services
39	E*Trade Financial Corporation
40	East West Bancorp, Inc
41	FNB Corporation
42	Fifth Third Bancorp
43	First BanCorp

44 First Commonwealth Financial Corp.
45 First Financial Bancorp
46 First Financial Bankshares, Inc
47 First Horizon National Corporation
48 First Midwest Bancorp, Inc
49 First NBC Bank Holding Company
50 First Niagara Financial Group, Inc
51 FirstMerit Corporation
52 Flagstar Bancorp Inc
53 Franklin Resources, Inc.
54 Fulton Financial Corporation
55 Glacier Bancorp, Inc
56 Goldman Sachs Group, Inc
57 Hancock Holding Company
58 Hanmi Financial Corporation
59 Home Bancshares, Inc.
60 Hudson City Bancorp Inc
61 Huntington Bancshares Inc
62 Independent Bank Corp.
63 Independent Bank Corporation
64 International Bancshares Corporation
65 Irwin Financial Corporation
66 JPMorgan Chase and Co
67 KeyCorp
68 Legg Mason Inc
69 MandT Bank Corporation
70 MB Financial Inc
71 Morgan Stanley
72 NBT Bancorp, Inc.
73 National Penn Bancshares, Inc.
74 Northern Trust Corporation
75 OFG Bancorp
76 Old National Bancorp
77 Oritani Financial Corp
78 PHH Corporation
79 PNC Financial Services Group Inc
80 PacWest Bancorp
81 People's United Financial, Inc
82 Pinnacle Financial Partners, Inc.
83 Popular, Inc
84 Privatebancorp, Inc.
85 Prosperity Bancshares, Inc
86 Provident Financial Services, Inc.
87 Raymond James Financial Inc
88 Regions Financial Corporation

89	S and T Bancorp, Inc.
90	SEI Investments Company
91	SLM Corporation-Sallie Mae
92	SVB Financial Group
93	Signature Bank
94	Simmons First National Corporation
95	Southside Bancshares, Inc
96	State Street Corporation
97	Stifel Financial Corp
98	SunTrust Banks, Inc.
99	Synovus Financial Corp
100	T. Rowe Price Group, Inc
101	TCF Financial Corporation
102	TD Ameritrade Holding Corporation
103	Talmer Bancorp Inc
104	Texas Capital Bancshares, Inc
105	Tompkins Financial Corp
106	TrustCo Bank Corp of NY
107	Trustmark Corporation
108	UMB Financial Corporation
109	US Bancorp
110	Umpqua Holdings Corporation
111	United Bankshares, Inc.
112	United Community Banks, Inc
113	Valley National Bancorp
114	Visa Inc
115	Washington Federal Inc
116	Webster Financial Corp
117	Wells Fargo and Company
118	Westamerica Bancorporation
119	Wilshire Bancorp, Inc.
120	Wintrust Financial Corporation
121	Zions Bancorporation

Source: Compiled by author from data obtained from Bankscope

Appendix 20: Correlation Matrix of independent variables

This table presents a Pearson correlation matrix of key variables of interest for the sample of banks included in our sample. The sample covers for all independent variables for the period of 2000 to 2014. All variables are defined in Appendix 18.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CPS	**1**	1.00															
CEOAGE	**2**	0.08**	1.00														
CEODUAL	**3**	-0.03	0.01	1.00													
CEOEXPERIENCE	**4**	0.11**	0.07*	0.01	1.00												
CEOGENDER	**5**	-0.04	-0.02	0.01	0.03	1.00											
NEWCEO	**6**	-0.08**	0.00	0.02	-0.3**	0.00	1.00										
RETIRINGCEO	**7**	0.05	0.44**	0.02	0.13**	0.07*	-0.1**	1.00									
IOP	**8**	-0.03	0.03	-0.01	0.00	0.02	-0.02	0.04	1.00								
IOV	**9**	-0.09**	-0.01	0.00	-0.05	0.01	0.02	-0.03	-0.02	1.00							
CRISIS	**10**	0.05	-0.09**	-0.03	-0.01	-0.05	0.09**	-0.3**	-0.1**	0.00	1.00						
SOX	**11**	-0.08**	0.00	-0.10*	-0.05	-0.03	-0.06*	0.00	0.02	0.00	0.03	1.00					
GEINDEX	**12**	-0.02	-0.02	0.08**	0.01	0.06	0.00	0.10**	0.02	-0.06	-0.1**	-0.3**	1.00				
DIRECTOWN	**13**	-0.01	0.04	-0.12**	0.00	-0.08*	-0.02	0.00	-0.05	0.01	0.16*	0.36*	-0.5**	1.00			
DEBT	**14**	-0.05	0.10**	0.00	-0.02	0.05	0.00	0.04	0.01	0.03	-0.1**	0.01	0.07*	-0.1**	1.00		
BOARDSIZE	**15**	-0.2**	-0.14**	0.00	-0.1**	0.09**	0.18**	-0.1**	0.02	0.00	-0.07*	-0.2**	0.15**	-0.2**	0.06	1.00	
TA	**16**	-0.17**	0.02	0.06	-0.2**	0.09**	0.00	-0.1**	0.08*	0.14**	-0.2**	-0.1**	-0.04	-0.2**	0.17**	0.19**	1.00

*statistically significant at the 5% margin; **statistically significant at the 1% margin.

Appendix 21: Variance Inflator Analysis (VIF)

This table presents a Variance Inflation Factors (VIF) of key variables of interest for the sample of firms included in our sample. The sample covers for all independent variables for the period of 2000 to 2014. All variables are defined in Appendix 18.

Variable	VIF	1/VIF
DIRECTOWN	1.77	0.566200
GEINDEX	1.60	0.623172
RETIRINGCEO	1.50	0.665362
TA	1.40	0.716456
CEOAGE	1.32	0.758439
CRISIS	1.29	0.773803
SOX	1.23	0.810725
BOARDSIZE	1.18	0.844019
CEOEXPERIENCE	1.18	0.848031
NEWCEO	1.15	0.872874
CPS	1.09	0.918799
DEBT	1.08	0.927294
CEOGENDER	1.04	0.965655
IOV	1.03	0.968109
CEODUAL	1.03	0.972046
IOP	1.02	0.980965
Mean	**1.24**	

Appendix 22: Firm Characteristics, Efficiency Scores, and Risk Index Descriptive Statistics

This table presents the firm characteristics, efficiency scores, and risk index descriptive statistics for the sample of firms included in our sample. The sample covers for all independent variables for the period of 2000 to 2014. All variables are defined in Appendix 18.

Panel A: Characteristics of Banks

Variable	Mean (USD '000)	Median (USD '000)	Std Dev (USD '000)
Employees (#Thousands)	15.056***	2.824***	44.178
Equity	13,781,490.570***	1,918,150.000***	40,507,914.690
Deposit/Equity	6.467***	6.821***	3.179
Profit before Tax	1,610,285.830***	224,300.000***	4,616,658.470
Total Operating Expenses	3,230,054.330***	175,750.000***	8,700,706.250
Total Assets	121,691.630***	14,787.210***	384,822.650
Return on Assets (ROA)	1.720***	1.034***	3.466
Liabilities - Total	108,009.170***	12,573.810***	344,909.360
Overheads	3,905,581.800***	418,200.000***	11,488,536.320

Figures are in thousands and for the year 2014. Only ROA and Deposit/Equity are in ratios.

Panel B: Efficiency Scores and Risk Index and Control Variables Descriptive Statistics

Variable	Mean	Median	Std Dev
EFFICIENCY	0.230***	0.180***	0.145
LN(ZSCORE3)	1.826***	1.928***	0.728
LN(ZSCORE5)	1.785***	1.878***	0.666
SDAR	0.089***	0.070***	0.066
SDD	0.024***	0.018***	0.017
IOV	24,898.170***	936.896***	315,422.090
IOPR	255.815***	273.492***	115.972
L5IO	104,804,527.000***	24,000,000.000***	283,413,134.000
BOARDSIZE	1.730***	1.609***	0.190
DEBT	0.090***	0.071***	0.087
GEINDEX	17.363***	13.000***	10.912
CPSi	0.374***	0.366***	0.137
CPSii	0.327***	0.324***	0.121
CPSiii	0.327***	0.324***	0.130
CPSiv	0.388***	0.388***	0.189

Panel C: Frequencies Tables for Control Variables

Variables	Frequency	Percent	Cumulative Frequency	Cumulative Percent
CeodualL:				
CEO not having duality roles	1161	99.15	1161	99.15
CEO having duality roles	10	0.85	1171	100.00
SOX:				
Year before SOX	69	5.89	69	5.89
Year after SOX	1102	94.11	1171	100.00
Retiringceo:				
CEO age is less than 60 years old	808	69.00	808	69.00
CEO age is more than 60 years old	363	31.00	1171	100.00
Newceo:				
Not having new CEO in the year	1100	93.94	1100	93.94

Having a new CEO in the year	71	6.06	1171	100.00
Ceoexperience:				
CEO tenure is less than 7 years	437	37.32	437	37.32
CEO tenure is more than 7 years	734	62.68	1171	100.00
Ceogender:				
Female	19	1.62	19	1.62
Male	1152	98.38	1171	100.00
Director Own:				
CEO is not having any ownership with the firm	345	29.46	345	29.46
CEO having ownership with the firm	826	70.54	1171	100.00
TARP:				
Not TARP recipients	775	66.18	775	66.18
TARP recipients	396	33.82	1171	100.00
Crisis:				
Years other than 2007-2009	907	77.46	907	77.46
During the financial crisis in the year 2007-2009	264	22.54	1171	100.00

Source: Compiled by author from data obtained from Bankscope, Execucomp and Compustat

Appendix 23: Bank efficiency and CPS

This table presents the findings on the relationship between the bank efficiency and CPS for the sample of firms included in our sample. The sample covers for all independent variables for the period of 2000 to 2014. All variables are defined in Appendix 18.

Panel B: Results of Efficiency on CPSii- Total Salary

		CPSii		
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	EFFICIENCY	EFFICIENCY	EFFICIENCY	CPSii
CPSii	-0.002***	-0.013***		
CEOAGE	-0.128*	-0.062	-0.092	
CEODUAL	0.088**	0.084	0.091*	-4.435
CEOEXPERIENCE	0.009	0.016	0.024**	-0.004
CEOGENDER	0.009	-0.027	-0.023	
NEWCEO	-0.004	-0.017	-0.011	-2.344
RETIRINGCEO	-0.009	-0.001	-0.002	
IOPR	0.000***	-0.000	-0.000	
IOV	-0.000***	-0.000***	-0.000***	
CRISIS	0.011	0.016	-0.041	-5.241
SOX	-0.161***	-0.167***	-12.834	
GEINDEX	-0.004***	-0.005***	-0.005***	-0.093
DIRECTOR OWN	0.027**	0.003	0.006	
DEBT	0.118**	0.126**	0.110**	
BOARDSIZE	-0.016	-0.152***	-0.137***	-6.623***
TA	0.107***	0.096***	0.099***	0.270
TARP				0.238
L5IO				-0.000
EFFICIENCY MEDIAN			-112.052	
PREDICTEDC PSII			-0.011***	
PREDICTED EFFICIENCY				-21.970
CFOISVP				4.827***
NUMBEROFVPS				-0.511
Constant	0.201	0.860**	32.363	56.084***
R-Squared	0.48	0.14		
Number of Observation	1,045	763	756	756
Anderson-Rubin Wald F-Statistic for joint relevance		7.165***	Instruments used in IV (2SLS)	CFO is VP Number of VPs EFFICIENCY industry-year median
Hansen J-statistic		1.109		
Wald chi2		460.930***		
Durbin-Wu-Hausman test of endogeneneity		.006		
First-stage F-statistic		4.480***		

Panel C: Results of Efficiency on CPS – Total Current Compensation

		CPSiii		
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	EFFICIENCY	EFFICIENCY	EFFICIENCY	CPSiii
CPSiii	-0.002***	-0.010***		
CEOAGE	-0.136*	-0.138	-0.158	
CEODUAL	0.092**	0.120**	0.124***	-1.340
CEOEXPERIENCE	0.011	0.029**	0.029***	1.415

CEOGENDER	0.009	-0.017	-0.008	
NEWCEO	-0.003	-0.007	-0.003	-1.639
RETIRINGCEO	-0.009	0.001	-0.003	
IOPR	0.000***	-0.000	0.000	
IOV	-0.000***	-0.000***	-0.000***	
CRISIS	0.007	0.001	-0.048	-1.360
SOX	-0.161***	-0.124**	-12.913	
GE INDEX	-0.004***	-0.004***	-0.004***	0.018
DIRECTOR OWN	0.028**	0.014	0.014	
DEBT	0.109*	0.056	0.050	
BOARDSIZE	-0.016	-0.155***	-0.132***	-8.950***
TA	0.104***	0.082***	0.090***	-0.237
TARP				-0.908
L5IO				-0.000*
EFFICIENCY MEDIAN			-112.759	
PREDICTED CPSIII			-0.008***	
PREDICTED EFFICIENCY				-27.578
CFOISVP				5.554***
NUMBEROFVPS				-0.525
Constant	0.214	0.862***	32.519	56.992***
R-Squared	0.48	0.24		
Number of Observation	1,045	763	756	756
Anderson-Rubin Wald F-Statistic for joint relevance		9.263***	Instruments used in IV (2SLS)	CFO is VP Number of VPs EFFICIENCY industry-year median
Hansen J-statistic		0.931		
Wald Chi2		516.570***		
Durbin-Wu-Hausman test of endogeneity		16.207***		
First-stage F-statistic		7.210***		

Panel D: Results of Efficiency on CPS- Total Contingent Compensation

	CPSiv			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	EFFICIENCY	EFFICIENCY	EFFICIENCY	CPSiv
CPSiv	-0.000**	-0.009**		
CEOAGE	-0.142**	-0.081	-0.101	
CEODUAL	0.095***	0.130	0.118**	-5.721
CEOEXPERIENCE	0.009	0.021	0.027***	0.014
CEOGENDER	0.013	0.003	0.013	
NEWCEO	-0.000	-0.011	-0.002	-2.384
RETIRINGCEO	-0.010	-0.014	-0.018	
IOPR	0.000***	0.000	0.000*	
IOV	-0.000***	-0.000***	-0.000***	
CRISIS	0.009	-0.010	-0.040	7.883
SOX	-0.145***	-0.092	-12.789	
GE INDEX	-0.004***	-0.001	-0.004***	0.476***
DIRECTOROWN	0.028**	0.028	0.049**	
DEBT	0.124**	0.118	0.092*	
BOARDSIZE	-0.005	-0.167**	-0.151***	-11.075**
TA	0.109***	0.101***	0.100***	-4.047
TARP				0.294
L5IO				-0.000
EFFICIENCYMEDIAN			-111.501	
PREDICTEDCPSIV			-0.007***	

PREDICTEDEFFICIENCY				23.397
CFOISVP				6.229***
NUMBEROFVPS				-0.375
Constant	0.128	0.637	32.025	57.042***
R-Squared	0.47	0.00		
Number of Observation	1,045	763	756	756
Anderson-Rubin Wald F-Statistic for joint relevance		7.942***	Instruments used in IV (2SLS)	CFO is VP Number of VPs EFFICIENCY industry-year median
Hansen J-statistic		0.191		
Wald Chi2		239.04***		
Durbin-Wu-Hausman test of endogeneity		0.192		
First-stage F-statistic		2.440***		

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Source: Compiled by author from data obtained from Bankscope, Execucomp and Compustat

Appendix 24: Return Volatility and CPS

This table presents the findings on the relationship between on return volatility and CPS for the sample of firms included in our sample. The sample covers for all independent variables for the period of 2000 to 2014. All variables are defined in Appendix 18.

Panel B: Results of Bank Return Volatility (Standard Deviation of Annual Stock Return-SDAR) on CPS – Total Salary

	CPSii			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	SDAR	SDAR	SDAR	CPSii
CPSii	-0.000**	-0.005***		
CEOAGE	-0.087*	-0.048	-0.069	
CEODUAL	0.004	-0.016	-0.009	-7.936*
CEOEXPERIENCE	-0.006	-0.003	-0.001	-0.100
CEOGENDER	-0.030**	-0.046**	-0.039***	
NEWCEO	0.008	0.009	0.011	-2.474
RETIRINGCEO	0.010**	0.018**	0.018***	
IOPR	-0.000	-0.000***	-0.000***	
IOV	-0.000	-0.000*	-0.000**	
CRISIS	0.051***	0.134***	-0.043	-5.323
SOX	-0.036***	-0.051*	0.040	
GE INDEX	-0.000*	-0.001	-0.001	-0.015
DIRECTOR OWN	-0.003	-0.014	-0.009	
DEBT	0.150***	0.172***	0.152***	
BOARDSIZE	0.004	-0.042**	-0.033**	-6.976***
TA	-0.008***	-0.015***	-0.011***	-2.242***
TARP				0.143
L5IO				-0.000
SDAR MEDIAN			1.688	
PREDICTED CPSII			-0.004***	
PREDICTED SDAR				37.537
CFOISVP				4.843***
NUMBEROFVPS				-0.567
Constant	0.342***	0.586***	0.364	55.417***
R-Squared	0.48	0.16		
Number of Observation	991	730	723	723
Anderson-Rubin Wald F-Statistic for joint relevance		7.517***	Instruments used in IV (2SLS)	CFO is VP Number of VPs SDAR industry-year median
Hansen J-statistic		0.018		
Wald chi2		435.320***		
Durbin-Wu-Hausman test of endogeneneity		9.997***		
First-stage F-statistic		4.270***		

Panel C: Results of Bank Return Volatility (Standard Deviation of Annual Stock Return-SDAR) on CPS – Total Current Compensation

	CPSiii			
		SDAR		
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	SDAR	SDAR	SDAR	CPSiii
CPSiii	-0.000*	-0.004***		
CEOAGE	-0.087*	-0.061	-0.094*	
CEODUAL	0.005	0.004	0.004	-4.335

CEOEXPERIENCE	-0.006	0.003	0.000	1.335
CEOGENDER	-0.030**	-0.042**	-0.033**	
NEWCEO	0.008	0.014	0.014	-0.911
RETIRINGCEO	0.010**	0.017**	0.017***	
IOPr	-0.000	-0.000***	-0.000***	
IOV	-0.000	-0.000	-0.000	
CRISIS	0.050***	0.129***	-0.043	1.357
SOX	-0.036***	-0.039	0.040	
GE INDEX	-0.000*	-0.000	-0.000	0.056
DIRECTOR OWN	-0.003	-0.009	-0.006	
DEBT	0.149***	0.138***	0.130***	
BOARDSIZE	0.004	-0.044**	-0.030*	-9.402***
TA	-0.008***	-0.020***	-0.014***	-3.610***
TARP				-0.845
L5IO				-0.000
SDARMEDIAN			1.671	
PREDICTEDCPSIII			-0.003***	
PREDICTEDSDAR				-13.174
CFOISVP				5.702***
NUMBEROFVPS				-0.656*
Constant	0.342***	0.559***	0.343	66.320***
R-Squared	0.48	0.26		

Number of Observation	991	730	723	723
Anderson-Rubin Wald F-Statistic for joint relevance		9.487***	Instruments used in IV (2SLS)	CFO is VP Number of VPs SDAR industry-year median
Hansen J-statistic		0.010		
Wald Chi2		493.180***		
Durbin-Wu-Hausman test of endogeneity		13.401***		
First-stage F-statistic		6.900***		

Panel D: Results of Bank Return Volatility (Standard Deviation of Annual Stock Return-SDAR) on CPS – Total Contingent Compensation

	CPSiv			
	SD Annual Stock Return			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	SDAR	SDAR	SDAR	CPSiv
CPSiv	-0.000	-0.004**		
CEOAGE	-0.087*	0.035	-0.074	
CEODUAL	0.006	0.009	0.002	-3.188
CEOEXPERIENCE	-0.006*	-0.001	-0.001	0.846
CEOGENDER	-0.030**	-0.033	-0.025*	
NEWCEO	0.008	0.014	0.014*	-1.365
RETIRINGCEO	0.009*	0.005	0.012*	
IOPr	-0.000	-0.000**	-0.000**	
IOV	-0.000	-0.000	-0.000*	
CRISIS	0.051***	0.126***	-0.038	6.462
SOX	-0.034***	-0.025	0.032	
GE INDEX	-0.000	0.001	0.000	0.407***
DIRECTOR OWN	-0.003	0.001	0.006	
DEBT	0.151***	0.164***	0.146***	
BOARDSIZE	0.005	-0.051*	-0.037**	-12.975***
TA	-0.008***	-0.012**	-0.011***	-0.863
TARP				0.079
L5IO				-0.000*
SDAR MEDIAN			1.644	

PREDICTED CPSIV			-0.003***	
PREDICTED SDAR				-1.823
CFOISVP				6.288***
NUMBEROFVPS				-0.335
Constant	0.330***	0.330	0.294	53.755***
R-Squared	0.48	0.00		
Number of Observation	991	730	723	723
Anderson-Rubin Wald F-Statistic for joint relevance		7.972***	Instruments used in IV (2SLS)	CFO is VP Number of VPs SDAR industry-year median
Hansen J-statistic		0.122		
Wald Chi2		286.840***		
Durbin-Wu-Hausman test of endogeneity		11.533***		
First-stage F-statistic		2.330***		

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Source: Compiled by author from data obtained from Bankscope, Execucomp, CRSP, and Compustat

Appendix 25: Bank Return Volatility and CPS

This table presents the findings on the relationship between on return volatility (Standard Deviation of Daily Stock Return- SDD) and CPS for the sample of firms included in our sample. The sample covers for all independent variables for the period of 2000 to 2014. All variables are defined in Appendix 18.

Panel A: Results of Bank Volatility (Standard Deviation of Daily Stock Return- SDD) on CPS - Total Compensation

	CPSi			
	SD Daily Stock Return			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	SDD	SDD	SDD	CPSi
CPSi	-0.000***	-0.001***		
CEOAGE	-0.012	-0.006	-0.008	
CEODUAL	0.006***	0.002	0.001	-3.341
CEOEXPERIENCE	-0.003***	-0.002*	-0.001	-0.609
CEOGENDER	-0.009*	-0.010***	-0.009***	
NEWCEO	-0.000	0.000	0.001	-3.039
RETIRINGCEO	0.002	0.003*	0.002*	
IOPR	-0.000	-0.000***	-0.000*	
IOV	0.000	-0.000*	-0.000*	
CRISIS	0.023***	0.036***	0.086	6.416
SOX	-0.011***	-0.007	-0.035	
GE INDEX	-0.000***	0.000	-0.000	0.167**
DIRECTOR OWN	0.002	-0.005**	-0.003*	
DEBT	0.031***	0.026***	0.024***	
BOARDSIZE	-0.001	-0.008**	-0.008**	-8.869***
TA	-0.001**	-0.002***	-0.002***	-1.388*
TARP				-0.208
L5IO				-0.000***
SDD MEDIAN			-1.490	
PREDICTED CPSI			-0.001***	
PREDICTED SDD				-159.736
CFOISVP				5.469***
NUMBEROFVPS				-0.665
Constant	0.073***	0.102***	0.142	60.184***
R-Squared	0.430	0.520		
Number of Observation	1,038	756	750	750
Anderson-Rubin Wald F-Statistic for joint relevance		8.975***	Instruments used in IV (2SLS)	CFO is VP Number of VPs SDD industry-year median
Hansen J-statistic		0.117		
Wald chi2		1078.890***		
Durbin-Wu-Hausman test of endogeneity		29.388***		
First-stage F-statistic		3.990***		

Panel B: Results of Bank Volatility (Standard Deviation of Daily Stock Return- SDD) on CPS - Salary

	CPSii			
	SD Daily Stock Return			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	SDD	SDD	SDD	CPS
CPSii	-0.000*	-0.001***		
CEOAGE	-0.010	0.004	-0.001	
CEODUAL	0.006***	-0.001	-0.001	-6.985*
CEOEXPERIENCE	-0.003***	-0.002*	-0.001	-0.165
CEOGENDER	-0.009*	-0.012***	-0.011***	
NEWCEO	0.000	0.001	0.001	-3.086*
RETIRINGCEO	0.002	0.003**	0.003***	
IOPR	-0.000*	-0.000***	-0.000***	
IOV	0.000	-0.000*	-0.000**	
CRISIS	0.023***	0.038***	0.087	-7.699
SOX	-0.010***	-0.013**	-0.036	
GE INDEX	-0.000***	-0.000	-0.000**	-0.016
DIRECTOR OWN	0.002	-0.005**	-0.004**	
DEBT	0.032***	0.032***	0.028***	
BOARDSIZE	-0.001	-0.008*	-0.007**	-6.363***
TA	-0.001**	-0.003***	-0.002***	-2.236***
TARP				0.363
L5IO				-0.000
SDD MEDIAN			-1.494	
PREDICTED CPSII			-0.001***	
PREDICTED SDD				223.051
CFOISVP				4.843***
NUMBEROFVPS				-0.520
Constant	0.068***	0.104***	0.145	52.130***
R-Squared	0.43	0.46		
Number of Observation	1,038	756	750	750
Anderson-Rubin Wald F-Statistic for joint relevance		7.123***	Instruments used in IV (2SLS)	CFO is VP Number of VPs SDD industry-year median
Hansen J-statistic		0.075		
Wald chi2		955.730***		
Durbin-Wu-Hausman test of endogeneity		7.919***		
First-stage F-statistic		4.470***		

Panel C: Results of Bank Volatility (Standard Deviation of Daily Stock Return- SDD) on CPS - Current

	CPSiii			
	SD Daily Stock Return			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	SDD	SDD	SDD	CPS
CPSiii	-0.000**	-0.001***		
CEOAGE	-0.011	-0.003	-0.006	
CEODUAL	0.006***	0.002	0.002	-4.101
CEOEXPERIENCE	-0.003***	-0.001	-0.001	0.903
CEOGENDER	-0.009*	-0.012***	-0.010***	

NEWCEO	-0.000	0.002	0.001	-1.610
RETIRINGCEO	0.002	0.004**	0.003***	
IOPr	-0.000*	-0.000***	-0.000***	
IOV	0.000	-0.000	-0.000	
CRISIS	0.023***	0.037***	0.088	1.983
SOX	-0.011***	-0.009*	-0.037	
GE INDEX	-0.000***	-0.000	-0.000	0.084
DIRECTOR OWN	0.002	-0.004*	-0.003**	
DEBT	0.031***	0.025***	0.023***	
BOARDSIZE	-0.001	-0.009**	-0.007**	-9.035***
TA	-0.002**	-0.004***	-0.003***	-3.667***
TARP				-0.775
L5IO				-0.000
SDD MEDIAN			-1.569	
PREDICTED CPSIII			-0.001***	
PREDICTED SDD				-46.828
CFOISVP				5.719***
NUMBEROFVPS				-0.566
Constant	0.071***	0.104***	0.145	64.440***
R-Squared	0.43	0.54		
Number of Observation	1,038	756	750	750
Anderson-Rubin Wald F-Statistic for joint relevance		9.285***	Instruments used in IV (2SLS)	CFO is VP Number of VPs SDDaily industry-year median
Hansen J-statistic		0.031		
Wald chi2		1110.790***		
Durbin-Wu-Hausman test of endogeneity		27.319***		
First-stage F-statistic		7.140***		

Panel D: Results of Bank Volatility (Standard Deviation of Daily Stock Return- SDD) on CPS - Contingent

	CPSiv			
	SD Daily Stock Return			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	SDD	SDD	SDD	CPS
CPSiv	-0.000*	-0.001**		
CEOAGE	-0.011	0.002	-0.002	
CEODUAL	0.006***	0.002	0.001	-5.781
CEOEXPERIENCE	-0.003***	-0.002	-0.001	-1.243
CEOGENDER	-0.009*	-0.010**	-0.008***	
NEWCEO	0.000	0.001	0.002	-2.270
RETIRINGCEO	0.002	0.002	0.002*	
IOPr	-0.000*	-0.000**	-0.000*	
IOV	0.000	-0.000	-0.000*	
CRISIS	0.023***	0.036***	0.086	0.540
SOX	-0.010***	-0.007	-0.036	
GE INDEX	-0.000***	0.000	0.000	0.094
DIRECTOR OWN	0.002*	-0.002	-0.000	
DEBT	0.032***	0.030***	0.026***	
BOARDSIZE	-0.001	-0.010*	-0.008**	-13.408***
TA	-0.001**	-0.002**	-0.002***	-2.243**
TARP				0.267
L5IO				-0.000*
SDD MEDIAN			-1.459	
PREDICTED CPSIV			-0.001***	
PREDICTED SDD				-26.389
CFOISVP				6.674***

NUMBEROFVPS				-0.447
Constant	0.069***	0.087**	0.128	72.747***
R-Squared	0.43	0.22		
Number of Observation	1,038	756	750	750
Anderson-Rubin Wald F-Statistic for joint relevance		7.973***	Instruments used in IV (2SLS)	CFO is VP Number of VPs SDD industry-year median
Hansen J-statistic		0.0300		
Wald chi2		655.780***		
Durbin-Wu-Hausman test of endogeneity		7.072***		
First-stage F-statistic		2.450***		

Source: Compiled by author from data obtained from Bankscope, Execucomp, CRSP, and Compustat

Appendix 26: Bank Stability and CPS- Z-Score 3

This table presents the findings on the relationship between on bank stability (ln(Z-Score3)) and CPS for the sample of firms included in our sample. The sample covers for all independent variables for the period of 2000 to 2014. All variables are defined in Appendix 18.

Panel B: Results of Bank Stability (ln(Z-Score3)) on CPSii – Total Salary

	CPSii			
	Bank Stability			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	ln(Z-Score3)	ln(Z-Score3)	ln(Z-Score3)	CPSii
CPSii	0.006	0.134***		
CEOAGE	1.131	-0.834	-0.252	
CEODUAL	0.166	0.745	0.660	-7.399*
CEOEXPERIENCE	0.537***	0.573***	0.474***	-1.134
CEOGENDER	0.220	0.782	0.655	
NEWCEO	-0.131	-0.098	-0.102	-1.684
RETIRINGCEO	0.040	-0.036	0.001	
IOPr	-0.001*	0.002*	0.002	
IOV	-0.000	0.000	0.000	
CRISIS	0.109	-1.491***	-1.019**	-2.476
SOX	0.360	1.789**	1.435**	
GE INDEX	0.018***	0.025**	0.025**	-0.075
DIRECTOR OWN	0.121	0.066	-0.033	
DEBT	-1.956***	-1.863**	-1.414**	
BOARDSIZE	-0.437	0.524	0.268	-5.648**
TA	0.130*	0.307**	0.236**	-2.690***
TARP				0.287
L5IO				-0.000
ZSCORE3 MEDIAN			0.003	
PREDICTED CPSII			0.111***	
PREDICTED LNZSCORE3				6.702**
CFOISVP				4.787***
NUMBEROFVPS				-0.567*
Constant	1.381	-3.862	-3.143	49.787***
R-Squared	0.16	0.00		
Number of Observation	1,030	751	747	747
Anderson-Rubin Wald F-Statistic for joint relevance		6.776***	Instruments used in IV (2SLS)	CFO is VP Number of VPs Ln(z-score3) industry-year median
Hansen J-statistic		0.565		
Wald chi2		115.760***		
Durbin-Wu-Hausman test of endogeneity		1.197		
First-stage F-statistic		4.470***		

Panel C: Results of Bank Stability (ln(Z-Score3)) on CPSiii – Total Current Compensation

	CPSiii			
	Bank Stability			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	ln(Z-Score3)	ln(Z-Score3)	ln(Z-Score3)	CPSiii
CPSiii	0.005	0.105***		
CEOAGE	1.157	-0.002	0.410	
CEODUAL	0.151	0.368	0.319	-5.110
CEOEXPERIENCE	0.533***	0.436***	0.440***	-0.050
CEOGENDER	0.218	0.653	0.501	
NEWCEO	-0.137	-0.205	-0.188	-0.799
RETIRINGCEO	0.039	-0.052	0.010	
IOPr	-0.001**	0.001	0.000	
IOV	-0.000*	0.000	0.000	
CRISIS	0.124	-1.355***	-0.958**	2.162
SOX	0.348	1.394*	1.424**	
GE INDEX	0.017***	0.012	0.016	0.039
DIRECTOR OWN	0.118	-0.070	-0.108	
DEBT	-1.933***	-1.177	-0.845	
BOARDSIZE	-0.444	0.547	0.178	-7.786***
TA	0.137*	0.442***	0.315**	-3.934***
TARP				-0.894
L5IO				-0.000
ZSCORE3 MEDIAN			0.003	
PREDICTED CPSiii			0.073**	
PREDICTED LNZSCORE3				8.561**
CFOISVP				5.453***
NUMBEROFVPS				-0.603*
Constant	1.398	-3.781	-2.515	48.985***
R-Squared	0.16	0.00		
Number of Observation	1,030	751	747	747
Anderson-Rubin Wald F-Statistic for joint relevance		8.792***	Instruments used in IV (2SLS)	CFO is VP Number of VPs Ln(z-score3) industry-year median
Hansen J-statistic		.6829		
Wald Chi2		127.220***		
Durbin-Wu-Hausman test of endogeneity		16.136***		
First-stage F-statistic		7.040***		

Panel D: Results of Bank Stability (ln(Z-Score3)) on CPSiv – Total Contingent Compensation

	CPSiv			
	Bank Stability			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	ln(Z-Score3)	ln(Z-Score3)	ln(Z-Score3)	CPSiv
CPSiv	0.004**	0.090**		
CEOAGE	1.199	-0.818	-0.095	
CEODUAL	0.152	0.277	0.361	-6.203
CEOEXPERIENCE	0.533***	0.522***	0.464***	-1.321
CEOGENDER	0.208	0.421	0.297	
NEWCEO	-0.139	-0.196	-0.199	-1.633
RETIRINGCEO	0.040	0.146	0.154	

IOPr	-0.001**	0.000	-0.001	
IOV	-0.000*	0.000	0.000	
CRISIS	0.100	-1.257***	-1.033**	0.209
SOX	0.352	1.290	1.589**	
GE INDEX	0.016**	-0.015	0.009	0.086
DIRECTOR OWN	0.107	-0.329	-0.424	
DEBT	-1.987***	-1.780*	-1.245*	
BOARDSIZE	-0.440	0.679	0.321	-13.800***
TA	0.125*	0.234*	0.219**	-2.045*
TARP				-0.021
L5IO				-0.000*
ZSCORE3 MEDIAN			0.003	
PREDICTED CPSiv			0.066**	
PREDICTED LNZSCORE3				1.271
CFOISVP				6.482***
NUMBEROFVPS				-0.470
Constant	1.418	-0.743	-1.072	70.020***
R-Squared	0.16	0.00		
Number of Observation	1,030	751	747	747
Anderson-Rubin Wald F-Statistic for joint relevance		7.469***	Instruments used in IV (2SLS)	CFO is VP Number of VPs Ln(z-score3) industry-year median
Hansen J-statistic		1.023		
Wald Chi2		85.980***		
Durbin-Wu-Hausman test of endogeneneity		3.319*		
First-stage F-statistic		2.450***		

Source: Compiled by author from data obtained from Bankscope, Execucomp and Compustat

Appendix 27: Bank Stability and CPS- Z- Score 5

This table presents the findings on the relationship between on bank stability (ln(Z-Score5)) and CPS for the sample of firms included in our sample. The sample covers for all independent variables for the period of 2000 to 2014. All variables are defined in Appendix 18.

Panel A: Results of Bank Stability (ln(Z-Score5)) on CPSi - Total Compensation

	CPSi			
	Bank Stability			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	ln(Z-Score5)	ln(Z-Score5)	ln(Z-Score5)	CPSi
CPSi	0.006**	0.055*		
CEOAGE	1.418	1.377	1.774	
CEODUAL	-0.067	0.241	0.287	-3.779
CEOEXPERIENCE	0.631***	0.611***	0.583***	-1.279
CEOGENDER	0.554*	0.644	0.435	
NEWCEO	-0.036	-0.061	-0.055	-2.445
RETIRINGCEO	-0.014	-0.031	-0.032	
IOPr	-0.001*	-0.000	-0.001	
IOV	-0.000***	0.000	-0.000	
CRISIS	0.164	-0.869***	-0.457	4.709
SOX	-0.060	0.447	0.745	
GE INDEX	0.015**	0.010	0.018**	0.158**
DIRECTOR OWN	0.126	0.011	-0.155	
DEBT	-2.756***	-2.146***	-1.929***	
BOARDSIZE	-0.420	0.139	-0.135	-7.343**
TA	0.054	0.181*	0.121	-1.171
TARP				-0.300
L5IO				-0.000**
ZSCORE5 MEDIAN			1.889	
PREDICTED CPSi			0.034	
PREDICTED LNZSCORE5				6.578*
CFOISVP				5.255***
NUMBEROFVPS				-0.733*
Constant	1.350	-2.191	-4.943	40.179***
R-Squared	0.18	0.06		
Number of Observation	1,039	759	753	753
Anderson-Rubin Wald F-Statistic for joint relevance		8.913***	Instruments used in IV (2SLS)	CFO is VP Number of VPs Ln(z-score5) industry-year median
Hansen J-statistic		2.101		
Wald chi2		144.570***		
Durbin-Wu-Hausman test of endogeneneity		10.503***		
First-stage F-statistic		3.930***		

Panel B: Results of Bank Stability (ln(Z-Score5)) on CPSii – Total Salary

	CPSii			
	Bank Stability			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	ln(Z-Score5)	ln(Z-Score5)	ln(Z-Score5)	CPSii
CPSii	0.009***	0.072*		

Ceoage	1.317	0.696	1.410	
Ceodual	-0.044	0.482	0.389	-6.820*
Ceoexperience	0.631***	0.614***	0.583***	-1.017
Ceogender	0.570*	0.796*	0.555	
Newceo	-0.030	-0.080	-0.052	-2.002
Retiringceo	-0.016	-0.091	-0.082	
IOPr	-0.001	0.001	0.000	
IOV	-0.000**	0.000	0.000	
Crisis	0.173	-1.009***	-0.472	-2.283
SOX	-0.039	0.894	0.767	
GE Index	0.016***	0.023**	0.023***	-0.055
Director Own	0.121	-0.023	-0.098	
Debt	-2.751***	-2.434***	-2.147***	
Boardsize	-0.399	0.150	-0.157	-5.936**
TA	0.060	0.189*	0.125	-2.381***
TARP				0.283
L5IO				-0.000
ZScore5 Median			1.889	
Predicted CPSii			0.048	
Predicted lnzscore5				5.033*
cfoisvp				4.848***
numberofvps				-0.569*
Constant	1.268	-2.283	-5.073	50.434***
R-Squared	0.19	0.06		
Number of Observation	1,039	759	753	753
Anderson-Rubin Wald F-Statistic for joint relevance		6.970***		
Hansen J-statistic		2.642	Instruments used in IV (2SLS)	CFO is VP Number of VPs Ln(z-score5) industry-year median
Wald chi2		144.700***		
Durbin-Wu-Hausman test of endogeneity		0.207		
First-stage F-statistic		4.560***		

Panel C: Results of Bank Stability (ln(Z-Score5)) on CPSiii – Total Current Compensation

	CPSiii			
	Bank Stability			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	ln(Z-Score5)	ln(Z-Score5)	ln(Z-Score5)	CPSiii
CPSiii	0.005*	0.055*		
Ceoage	1.358	1.153	1.710	
Ceodual	-0.071	0.274	0.220	-4.385
Ceoexperience	0.628***	0.540***	0.580***	-0.065
Ceogender	0.565*	0.734*	0.474	
Newceo	-0.042	-0.139	-0.095	-1.024
Retiringceo	-0.015	-0.096	-0.069	
IOPr	-0.001*	0.000	-0.001	
IOV	-0.000***	-0.000	-0.000	
Crisis	0.196	-0.936***	-0.452	2.709
SOX	-0.072	0.681	0.762	
GE Index	0.016***	0.016*	0.020**	0.060
Director Own	0.118	-0.094	-0.128	
Debt	-2.729***	-2.048***	-1.934***	
Boardsize	-0.425	0.145	-0.256	-7.813***
TA	0.064	0.258**	0.141	-3.540***

TARP				-0.881
L5IO				-0.000
ZScore5 Median			1.878	
Predicted CPSiii			0.026	
Predicted lnzscore5				7.991***
cfoisvp				5.550***
numberofvps				-0.609*
Constant	1.408	-2.179	-4.426	46.396***
R-Squared	0.18	0.08		
Number of Observation	1,039	759	753	753
Anderson-Rubin Wald F-Statistic for joint relevance		9.071***	Instruments used in IV (2SLS)	CFO is VP Number of VPs Ln(z-score5) industry-year median
Hansen J-statistic		2.667		
Wald Chi2		148.350***		
Durbin-Wu-Hausman test of endogeneity		22.884***		
First-stage F-statistic		7.220***		

Panel D: Results of Bank Stability (ln(Z-Score5)) on CPSiv – Total Contingent Compensation

	CPSiv			
	Bank Stability			
Estimation type	OLS	IV (2SLS)	Simultaneous equations (2SLS)	
Dependent Variables	ln(Z-Score5)	ln(Z-Score5)	ln(Z-Score5)	CPSiv
CPSiv	0.003	0.044		
CEOAGE	1.393	0.955	1.531	
CEODUAL	-0.079	0.214	0.236	-6.151
CEOEXPERIENCE	0.632***	0.581***	0.588***	-1.182
CEOGENDER	0.553*	0.619	0.402	
NEWCEO	-0.049	-0.137	-0.099	-1.743
RETIRINGCEO	-0.011	-0.002	-0.018	
IOPr	-0.001*	-0.000	-0.001	
IOV	-0.000***	0.000	-0.000	
CRISIS	0.184	-0.899***	-0.478	-0.025
SOX	-0.095	0.637	0.819	
GE INDEX	0.015**	0.003	0.017*	0.082
DIRECTOR OWN	0.112	-0.219	-0.239	
DEBT	-2.780***	-2.351***	-2.074***	
BOARDSIZE	-0.447	0.137	-0.204	-12.965***
TA	0.048	0.143	0.107	-2.117*
TARP				0.028
L5IO				-0.000*
ZSCORE5 MEDIAN			1.874	
PREDICTED CPSiv			0.023	
PREDICTED LNZSCORE5				1.203
CFOISVP				6.615***
NUMBEROFVPS				-0.520
Constant	1.602	-0.736	-3.918	69.286***
R-Squared	0.18	0.00		
Number of Observation	1,039	759	753	753
Anderson-Rubin Wald F-Statistic for joint relevance		7.948***	Instruments used in IV (2SLS)	CFO is VP Number of VPs Ln(z-score5) industry-year median

Hansen J-statistic	2.752*
Wald Chi2	126.320***
Durbin-Wu-Hausman test of endogeneity	1.721
First-stage F-statistic	2.430***

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Source: Compiled by author from data obtained from Bankscope, Execucomp and Compustat

Appendix 28: Submitted Work

Dear Professor Mohamad

Manuscript ID: APE-2016-0696

Manuscript title: Acquisitions of Financially Constrained Targets

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Applied Economics incorporating Applied Financial Economics

Acquisitions of Financially Constrained Targets

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Acquisitions of Financially Constrained Targets

Abstract

We examine the extent to which bidders' stock returns at acquisition announcements reflect the financing needs of the target firm. We find that bidders of financially constrained targets pay lower acquisition premiums and earn higher announcement period cumulative abnormal returns than bidders of unconstrained targets. The lower premium and positive stock market reaction are both sources of value for bidders' shareholders. Our results contrast the findings of the literature that document an insignificant wealth transfer to bidder shareholders.

Keywords: Mergers and Acquisitions; Financial Constraints; Financially Constrained Targets; Event Study; Cumulative Abnormal Returns; M&A Premiums

Acquisitions of Financially Constrained Targets

1. Introduction

In this paper, we examine the wealth effects of targets' financial constraints in mergers and acquisitions (M&A). Kaplan and Zingales (1997) classify firms as financially constrained as long as there exists a "wedge" between their internal and external costs of finance. Since there always exists an extra cost to raise external finance (for example, flotation costs in raising new equity), all firms are financially constrained by default, albeit to a different degree. We use an index derived from Kaplan and Zingales (1997) to categorise target firms in domestic US M&As as financially constrained. The benefit of using the KZ classification in M&A is that it allows us to differentiate amongst targets based on their financial constraints. We then test how the target firms' financial constraint affects the premium paid by bidder firms in M&A, as well as its impact on the wealth of the bidder shareholders. We also examine the factors that cause bidders to select targets that are financially constrained.

Lamont, Polk and Saa-Requejo (2001), whose study draws heavily from Kaplan and Zingales (1997), define "financial constraints" as frictions that prevent a firm from financing all its desired investments. The interesting question, therefore, is whether investors perceive the M&A market as a place to resolve target firms' financial constraints. Using a sample of European acquisitions and accounting data, Erel, Jang and Weisbach (2015) document a decline in target firms' cash balance, sensitivity of cash-to-cash flow and sensitivity of investment-to-cash flow post-acquisition. The authors conclude that acquisitions relieve financial frictions in target firms and is a potential source of value. However, 97.4% of their sample targets are private firms. It would be of interest to see whether investors reward the acquisitions of publicly-listed traded targets, which are subject to more public scrutiny and have access to more sources of funds (for instance, the stock market) than private firms. Our paper is a test for evidence using a different sample (i.e., US-based domestic acquisitions), wealth variables (i.e., stock market-based M&A announcement period returns and M&A premiums) and measures of targets' financial constraints (i.e., the Kaplan-Zingales Index) to ascertain the value created in acquisitions of financially-constrained targets. The sample of public

targets provides a stiffer test of the benefits of M&A since these firms have access to more sources of funds than private firms do and, therefore, they would rely on the M&A market less than private firms do as a mean to resolve their financial constraints.

Following this opening section, we undertake a review of the literature in Section 2, prior to formulating our hypotheses. We also outline the research importance in that section. The third section presents our research approach and sampling procedures. We present and discuss our findings in Section 4; and, conclude the paper in the final section.

2. Literature Review and Hypotheses Development

Kaplan and Zingales (1997) (henceforth KZ), find that "financially constrained" does not equate to "financially distressed". They find that financially constrained firms are associated with increases in debt. Moreover, firms that are likely or possibly constrained are associated with respectable interest coverage ratios, i.e., their medians range between 2.84 and 4.20. Lastly, possibly constrained firms are as healthy as firms that were never financially constrained. Conversely, using 62 financially distressed firms from 1979-1988 (which coincides with KZ's sample period), Brown, James and Mooradian (1994) document mean and median interest coverage ratios of 0.634 and 0.434, respectively. Furthermore, the authors document that financially distressed firms are "extremely" highly geared with mean and median leverage ratios of 0.83 and 0.792, respectively, which severely handicap their ability to raise further debt and these firms have recourse to asset sales as a means to raise finance. Consequently, the financial characteristics between financially-constrained and financially-distressed/bankrupt firms differ.

Lamont *et al.* (2001) too do not use "financial constraints" to mean financial distress or economic distress or bankruptcy risk though the authors caution that they are possibly correlated (similar to Livdan, Sapriza and Zhang's (2009) study of the effects of financial constraints on expected returns). Likewise, while it is well documented that the stock returns of financially distressed firms are negative (see Campbell, Hilscher and Szilagyi, 2011), there is little consensus on the direction of stock returns of financially constrained firms. Lamont *et al.* (2011) report that financial constraints and stock returns are inversely related while Whited and Wu (2006), and Livdan, Sapriza and

Zhang's (2009) find that they are directly related. Thus, results based on studies of acquisitions of failed/bankrupt/distressed targets (for instance, Bartunek, Madura and Tucker, 1995; Hotchkiss and Mooradian, 1998; Jory and Madura, 2009; Faelten and Vitkova, 2014; Meier and Servaes, 2014; Precourt and Oppenheimer, 2016; Bruyland and Maeseneire, 2016) are not wholly applicable to acquisitions of financially constrained firms.

We briefly summarize the findings of the literature on distressed and bankrupt acquisitions as follows. Bruton, Oviatt and White (1994) examine 51 acquisitions of financially distressed firms and find that acquirer's prior acquisition experience is positively related to acquisition performance. Clark and Ofek (1994) find that restructuring success is positively related to the financial distress of the target. Using a sample of 55 acquisitions in Chapter 11, Hotchkiss and Mooradian (1998) document positive and significant abnormal stock returns for the bidder and bankrupt target at the announcement of the acquisition. The authors conclude that takeovers represent an efficient deployment of bankrupt assets. Bartunek, Madura and Tucker (1995), Jory and Madura (2009), and Faelten and Vitkova (2014) find that acquirers of bankrupt assets earn positive abnormal returns at the M&A announcement. Meier and Servaes (2014) document that acquirers of bankrupt companies or assets earn excess returns higher than when they acquire regular targets. The authors conclude that this evidence is consistent with the view that acquirers benefit from fire sales of distressed and bankrupt companies. Precourt and Oppenheimer (2016) find that distressed targets sell their assets at a premium compared to bankrupt firms. They also find that acquisitions in Chapter 11 offer greater economic value than acquisitions outside of bankruptcy. Bruyland and Maeseneire (2016) find that acquisitions of distressed firms lead to an increase in bidder's default risk.

M&A remains an important corporate restructuring and reorganization strategy, and research on the topic has been ongoing for several decades. The findings from the finance literature suggest that while M&A reward target firm shareholders, they fail to deliver for bidder firm shareholders (Gregory, 1997; Agrawal and Jaffe, 2000). There are various propositions advanced to explain this underperformance. For instance, it is likely that managers of the bidding firms view takeovers as a means to maximize their own

interests at the expense of their shareholders (Cartwright and Schoenberg, 2006), which is consistent with the classic agency theory of Jensen and Meckling (1976). There is also the possibility that these managers overestimate the value of their target firms (Seth, Song and Pettit, 2000), which is consistent with the managerial hubris hypothesis of Jensen and Ruback (1983) and Fuller *et al.* (2002). Under the managerial hubris hypothesis, managers of the bidding firm erroneously believe that they are better able to extract value from the target firm's assets than the target's current managers.

Besides the finance literature, attempts to explain the disappointing performance of M&A have been made in the strategy and organizational behaviour literature. While not an exhaustive list, the following reasons have been advanced as explanations of the bidding firms' underperformance: wrong decision-making and poor integration processes (also see, Schweiger and Very, 2003); poor organizational learning from prior M&A experiments (also see, Hayward, 2002); and a lack of culture fit between the bidder and the target (also see, Cartwright, 2005).

Despite the extant research on M&A, the empirical findings to date suggest that M&A continue to underperform prompting calls for the examination of omitted variables in the literature (see King *et al.*, 2004). We examine the financial constraints of the target firms, which is important for various reasons. First, Lamont *et al.* (2001) find that "financial constraints" affect firm value and that the stock performance of financially constrained firms differs from unconstrained ones. Other studies that document how financial constraint affects stock returns include Gomes, Yaron and Zhang (2006), Whited and Wu (2006), Livdan, Sapriza and Zhang (2009), and Campello and Chen (2010). To the extent that "financial constraints" is a priced factor in stock returns, it would affect the stock returns of acquirers at M&A announcements. To the best of our knowledge, how much of this factor affects bidders' wealth in M&A is yet to be resolved. This paper tests the extent to which part of the factor structure in bidders' stock returns at M&A announcements reflects a particular source of economic information, i.e., the degree of financial constraints in the target firm.

Second, and as documented above, financial constraints do not necessarily imply that the business' survival is at stake to the same extent as financial distress. In the latter case, these firms are close to or already in a bankruptcy state. Firms that are financially

distressed often cannot secure financing without major restructuring (mostly through Chapters 7 and 11 of the Bankruptcy Reform Act of 1978). Conversely, financially constrained firms do not require to be restructured to continue in operation.

Third, and to the extent that "financial constraints" and "financial distress" are partially correlated, in many instances it is not possible to calculate an index of financial constraints for bankrupt or distressed targets since many of them become delisted. Conversely, our study offers the possibility to calculate an index of financial distress for all target firms, which should serve to complement prior findings and resolve potential biases inherent in samples of distressed and/or bankrupt targets.

The major difficulty of financially constrained firms is a lack of liquidity and capital, which could be due to internal as well as external factors (for instance, during the peak of the 2007-2008 global financial crisis many firms experienced difficulties in raising finance (Ivashina and Scharfstein, 2010; Mokhova, 2011)). These firms could potentially fare better from external funding. It is in this context that we argue that M&A can be a source of value-added. The bidder firm can possibly extract value from the acquisition of a financially constrained target in two ways: (i) by unblocking vital sources of finances to allow the target firm to realize its potential, and (ii) by negotiating a bargain deal that will benefit its shareholders. To the extent that a target firm is in violation of debt covenants, deprived of its usual sources of credit, renegotiating debt payments, or unable to fund new investments (Kaplan and Zingales, 1997), the combination of its business with another firm would increase the combined entity's asset base, which should improve access to finance for the target firm. All other things being equal, it is unlikely that a bidder firm will pay the same premium for a financially constrained target as for an unconstrained one and does not extract a price for improving the target's access to finance. As far as bidder firms extract a price for improving the sources of finance of target firms (consistent with Stein, 1997, and Erel *et al.*, 2015), acquisitions of

financially constrained targets would be associated with lower M&A premium.[16] The lower premium serves to compensate the bidder firm in lessening the financial constraints of the target firm. Thus, in terms of hypotheses, we offer two direct tests as follows:

H1: Bidders of financially constrained targets (FCTs) experience positive announcement period cumulative abnormal returns (CARs)

H2: The M&A premium is inversely related to a target's degree of financial constraint

3. Data and Methods

3.1 Data and Sampling

Our sample period starts in 1985 and ends in 2012. Domestic M&A data is obtained from the Thomson One Deal database. Both bidders and targets are US publicly-listed firms, and M&A deals are completed as well as the deal value is reported. We exclude firms with SICs 4900-4999 and 6000-6999 since they are highly regulated. Bidder firms should have return data in the Center for Research in Security Prices (CRSP) database and accounting data in the COMPUSTAT database. Target firms should have data in CRSP to calculate the M&A premium and they should have data in COMPUSTAT to calculate their KZ index. The sample distribution is presented in Table 1.

[INSERT TABLE 1 ABOUT HERE]

The highest number of M&A occurred in the year 1998 (309 in that year, which represents 7.01% of the total sample). The second highest number of acquisitions

[16] Stein (1997) suggests that headquarters tend to realign internal funds to prioritise projects with positive net present values. It implies an investment interdependence between the newly acquired target firm and the rest of the bidder company's divisions/subsidiaries since they are now all located under the same roof and can compete equally for internal funds.

occurred in 1999 (n = 280, which represents 6.36% of the overall sample). The total number of M&A over the sample period from 1985 to 2012 is 4,405.

3.2 KZ Index

Lamont *et al.* (2006) derive an index of financial constraint based on Kaplan and Zingales (1997), which they refer to as the KZ Index and is estimated as follows:

$$\begin{aligned}\text{KZ Index}_t = {} & -1.002\left(\frac{\text{Cash Flow}_t}{\text{PPE}_{t-1}}\right) + 0.283\,\text{Q}_t \\ & + 3.139\left(\frac{\text{Debt}_t}{\text{Debt}_t + \text{Book Equity}_t}\right) - 39.368\left(\frac{\text{Dividends}_t}{\text{PPE}_{t-1}}\right) \\ & - 1.315\left(\frac{\text{Cash}_t}{\text{PPE}_{t-1}}\right) + \epsilon_t\end{aligned} \tag{1}$$

where cash flow is computed as Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA), Q is the ratio of (Book Value of Assets minus Book Value of Equity minus Deferred Taxes plus Market Value of Equity)-to-Book Value of Assets; Debt is the sum of long-term debt and current liabilities; and PPE is the value of property, plant and equipment. The KZ index is directly related to a firm's financial constraints. Thus, a financially-constrained firm is one with low cash flow-to-PPE and high debt ratio. The firm also pays low dividends and has a low cash balance relative to its PPE.

3.3 Classification of Target Firms by KZ Index

After calculating the KZ index for each target firm, we form quartiles by ranking all target firms using their KZ index. We refer to the top quartile as financially constrained targets (FCTs) and the bottom quartile as unconstrained targets (non-FCTs). We do this for the sake of analysis and presentation of the results. While there is no certainty that the top and bottom quartiles comprise all financially-constrained and unconstrained targets, respectively, yet, as a group, the top quartile targets are more financially constrained than the bottom quartile. Our classification seems to work since both the mean and median KZ index increase monotonically as we move up the quartiles from 1 to 4 (see Table 2). For instance, the median KZ indices in Quartiles 1 to 4 are -9, 0, 2 and 3, respectively, with higher KZ Index representing more financial constraints. Despite its flaws (Hadlock and Pierce, 2010), Lamont *et al.* (2011) argue that the KZ index is a useful

one out of the measures of financial constraints since it is based on an in-depth study of firms. Many other studies in corporate finance use the KZ index including Baker, Stein and Wurgler (2002); Almeida, Campello and Weisbach (2004); Hovakimian (2009); Campello and Chen (2010); and Li (2011).

The classification scheme leaves us with target firms at two ends (Q1 vs. Q4) of the financial constraint spectrum as follows: at one end we have the most financially constrained firms (FCTs) that face the largest "wedge" between their internal and external costs of funds (i.e., Q4 or Quartile 4 firms), and at the other end we end up with the least financially constrained firms with the most amount of liquid assets (i.e., Q1 or Quartile 1 firms). The rank of a quartile increases monotonically with financial constraint.

3.4 Measuring Bidders' Cumulative Abnormal Returns (CARs)

Bidders' abnormal returns are obtained from the following market model:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \epsilon_{i,t} \quad (2)$$

where i represents bidder firm i, t represents a day, R represents a bidder's daily return and R_m represents the daily return on the CRSP equally-weighted portfolio. We estimate the market model using the 255 daily returns ending 11 days prior to the M&A announcement. We cumulate the daily abnormal returns surrounding the announcement date to obtain the announcement period cumulative abnormal returns (CARs). Day 0 represents the day of the M&A announcement and we present CARs for the following windows, i.e. (-2, +1), (-2, 0) and (-3, 0). We include the daily returns of the days immediately preceding the announcement to account for possible leakage of the M&A news. To confirm hypothesis 1, we expect bidders' CARs to be positive and statistically significant.

3.5 M&A Premium

To the extent that bidders alleviate the financial constraint of the target firms and enable them to finance their desired investments as well as to reduce their costs of capital, bidders will charge target firms a price for that facility. Consequently, we hypothesize

that the M&A premium paid by bidders of financially constrained targets (FCTs) would be lower than that paid for unconstrained targets (non-FCTs). The M&A premium is the surplus by which the deal value exceeds the target firm's market capitalization four weeks prior to the M&A announcement. The M&A premium is expressed as a percentage of the target firm's market capitalization. To confirm hypothesis 2, we expect FCTs and M&A premiums to be inversely related.

$$\text{M\&A Premium} = \frac{\text{Deal Value} - \text{Target Market Capitalization 4 wks prior to Announcement}}{\text{Target Market Capitalization 4 wks prior to Announcement}} \quad (3)$$

We present descriptive statistics on the KZ Index, CARs and MA Premium for the overall sample in Table 2.

[INSERT TABLE 2 ABOUT HERE]

In Table 3, we present the various CARs by quartiles of the KZ index. Irrespective of the CAR windows, both the mean and median CARs are negative for targets in the first quartile (i.e., the non-FCTs) and positive for targets in the fourth quartile (i.e., the FCTs), respectively. Thus, bidders experience a negative market reaction upon announcement of acquiring a non-FCT but experience a positive market reaction in acquisitions of FCTs.

[INSERT TABLE 3 ABOUT HERE]

4. Results

4.1 Univariate Tests of CARs by KZ Index

We compare the mean CARs by quartiles of KZ index in Panel A of Table 4. The mean (-3, 0) CARs of bidders of FCTs is 0.7% and the median is -0.1%. The mean is significantly different from 0 but not the median. Conversely, the mean CARs of bidders of non-FCTs is -0.3% and the median is -0.1%, though, both are insignificantly different from zero. Upon comparing the mean CARs between bidders of FCTs and non-FCTs, the mean CARs of bidders of FCTs exceed that of non-FCTs by 1.0%, and the difference is statistically significant. In unreported results, tests based on (-2, +1) CARs and (-2, 0) CARs yield

similar findings. Thus, consistent with hypothesis 1, the CARs of bidders of FCTs are positive.

[INSERT TABLE 4 ABOUT HERE]

As a robustness check, we combine the third and fourth quartiles of FCTs and compare the mean and median CARs of that group with the first quartile of non-FCTs. Our findings stay the same, i.e., the CARs of bidders of FCTs from quartiles 3 and 4 are significantly higher than the CARs of bidders of non-FCTs from quartile 1. The differences in mean and median CARs are 1.1% and 0.1%, respectively, and both are statistically significant.

4.2 Univariate Tests of M&A Premiums by KZ Index

In Panel B of Table 4, we compare and contrast the M&A premium paid between bidders of FCTs and non-FCTs. The mean (median) M&A premium paid by bidders of FCTs is 4.4% (-1.5%) and that paid by bidders of non-FCTs is 39% (-1.7%). Using median figures, the M&A premium paid by bidders of FCTs is lower by 0.79% and that difference is statistically significant at the 5% level. Thus, consistent with hypothesis 2, the univariate findings suggest that bidders of FCTs pay lower M&A premiums than bidders of non-FCTs.

4.3 Multiple Regressions of Bidder CARs

To be able to associate the positive announcement period CARs to acquisitions of FCTs and to remove the effects of confounding variables, we perform multiple regressions of bidders' CARs. First, though, we account for endogeneity issues to control for the risk of incorrectly identifying a causal relationship between acquisitions of FCTs and bidders' M&A announcement period CARs, when the observed "relationship" could be due to an unidentified factor that is affecting both variables.

To control for endogeneity, we use the Heckman two-stage estimation procedure. This method is appropriate since we have a non-random sample selection, i.e., bidder CARs are only observed for targets that accepted an offer. Consequently, our estimators could be biased since we do not know what the outcome would be for those targets that

refused a bidder's offer. To control for the sample selection bias, we predict the likelihood of a target firm accepting a bidder's offer at the first stage using a probit model, calculate the predicted inverse Mills ratio (IMR) for each M&A transaction, and in the second stage, estimate the bidders' CAR using the IMR as a predictor in the model (also see Wooldridge, 2009). If the coefficient on IMR is statistically equal to zero, there is no evidence of sample selection endogeneity, and ordinary least squares (OLS) regression results are consistent. If the coefficient on IMR is statistically different from zero, then we report the coefficients from the corrected model. To conserve space, the independent variables used are presented in the notes accompanying Tables 5 and 6. The selection of the independent variables follows previous studies on the determinants of M&A premium (Walkling and Edmister, 1985; Kaufman, 1988; Lang *et al.*, 1989; Servaes, 1991; Palia, 1993; Cotter and Zenner, 1994; Schwert, 2000; Flanagan and O'Shaughnessy, 2003; Madura and Ngo, 2008).

The dependent variable in the first-stage probit regression takes a value of 1 for targets that are in the fourth quartile (i.e., the most financially constrained) and a value of 0 for targets in the first quartile (i.e., the unconstrained firms). We present the findings from the first-stage probit regressions in Table 5. Successful bids of FCTs are characterized as follows: low bidder's interest coverage ratio; large bidder size; stock offers; small target size; acquisitions of certain assets; multiple bids; large number of target firm M&A advisors; and, tech firms.

[INSERT TABLE 5 ABOUT HERE]

We include the IMR in the multiple regression of bidder CARs and present our findings in Table 5. The coefficient of the IMR is not statistically significant from 0 at the 5% level suggesting that the OLS regression results are consistent. The variable of interest is FCT, which takes a value of 1 for FCTs in quartile 4 and a value of 0 for unconstrained targets in quartile 1. The coefficient of the dummy variable FCT is positive and statistically significant. Our coefficient estimate suggests that bidders' of FCTs experience a 4.60% CARs from day -3 to the day of the M&A announcement higher than the CARs of bidders of unconstrained targets. Considering that the average size of the bidder firm is $7,672 million, the increase in the wealth of the shareholders of a typical

bidder of an FCT as opposed to an unconstrained target is an extra $353 million over four days leading up to the M&A announcement. Our results stay the same if we increase the sample size of FCTs to include quartile 3 firms. As expected, though, there is a decrease in the magnitude of the coefficient from 4.60% to 3.90% given that the enlarged set includes the less financially constrained targets from quartile 3.

We further find that bidder size and strategic acquisitions adversely affect the bidder CARs, while all cash offers and acquisitions of certain assets positively affect bidder CARs. Bidders' CARs are higher post-SOX, and while the global financial crisis starting mid-2007 adversely affected bidder CARs yet the related coefficient is not statistically significant.

4.4 Multiple Regressions of M&A Premiums

We follow the same Heckman two-stage estimation procedure to ascertain the effects of acquisitions of FCTs on the M&A premium paid by bidder firms, and present our findings in Table 6. The size of the coefficient representing FCTs is negative and large, and it is statistically significant. The findings suggest that FCTs are sold at a considerable discount relative to unconstrained targets (i.e., non-FCTs). Our findings stay the same upon enlarging the sample of FCTs to include targets from both quartiles 3 and 4.

[INSERT TABLE 6 ABOUT HERE]

Furthermore, large bidders tend to pay higher M&A premiums and acquisitions of certain assets, acquisitions in the tech industry, and contested bids command higher premiums. Conversely, bidders that pay with cash also pay lower M&A premiums and the smaller the target size, the smaller is the M&A premium.

5. Conclusion

The empirical analysis in this paper establishes two things, i.e. (i) bidders of financially constrained targets (FCTs) pay lower M&A premiums and (ii) earn higher M&A announcement period CARs than bidders of unconstrained targets.

The findings do not necessarily suggest that acquisitions of FCTs are superior than the acquisitions of non-FCTs. As a matter of fact, in undocumented findings we observe that the long run stock performance of bidders of FCTs and their operating performance

are not remarkable. However, this paper establishes the merits of acquiring FCTs as a corporate reorganization strategy using market-based data and investors' perceptions of value.

The major difficulty of FCTs is a lack of liquidity and capital, which could be due to both internal and external factors. These firms are not bankrupt and they are not undertaking any financial restructuring. Thus, bidders can extract value from the acquisition of an FCT by unblocking vital sources of finances to allow the firm to realize its potential, which should lead to positive M&A announcement period cumulative abnormal returns (CARs).

To the extent that the M&A enlarges the asset base of the target firm, which should restrict collateral constraints in raising external finance, we would expect bidder firms to charge a price for providing this facility. The discount in the deal value compared to acquisitions of non-FCTs represents a pseudo-fee bidders charge to alleviate the target firm's financial constraints. We are not advocating that post-M&A target firms are in a position to finance all desired investments thanks to bidders' financial power. We only expect that targets are in a better position to bridge the gap between their desired investments and their access to funds following the M&A, i.e., there is a lessening in their pre-M&A level of financial constraints.

Based on the above arguments, which are corroborated by the findings of this paper, acquisition of FCTs represents a viable corporate restructuring and reorganization strategy to lessen the financial constraints of target firms and to extract value for the bidder shareholders.

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Table 1: Sample Distribution of M&A Involving Financial Constrained Targets (FCTs)

	FCT	
Year of Announcement	***N***	**%**
1985	0	0
1986	158	3.59
1987	184	4.18
1988	184	4.18
1989	194	4.40
1990	171	3.88
1991	141	3.20
1992	107	2.43
1993	123	2.79
1994	208	4.72
1995	240	5.45
1996	240	5.45
1997	247	5.61
1998	309	7.01
1999	280	6.36
2000	264	5.99
2001	150	3.41
2002	96	2.18
2003	125	2.84
2004	131	2.97
2005	147	3.34
2006	125	2.84
2007	150	3.41
2008	102	2.32
2009	81	1.84
2010	86	1.95
2011	77	1.75
2012	85	1.93
Total	4,405	100.00

The sample period starts in 1985 and ends in 2012. Domestic M&A data is obtained from the Thomson One Deal database. Both bidders and targets are US publicly-listed firms, and M&A deals are completed as well as the deal value is reported. We exclude firms with SICs 4900-4999 and 6000-6999 since they are highly regulated. Bidder firms should have return data in the CRSP database and accounting data in the COMPUSTAT database. Target firms should have data in CRSP to calculate the M&A Premium and they should have data in COMPUSTAT to calculate their KZ Index. FCT stands for Financially Constrained Targets.

Table 2: Descriptive Statistics of M&A Involving FCTs*

	N	*Mean*	*Median*	*Standard Deviation*
Target Characteristics				
Target Size	4405	$2,892,800,000	$248,739,000	$18,645,850,000
KZ Index	4,405	-9.308	1.105	98.526
KZ Index by Quartiles:				
1st Quartile	1085	-43.078***	-9.233***	194.637
2nd Quartile	1115	-0.518***	-0.314***	1.115
3rd Quartile	1104	1.997***	2.045***	0.468
4th Quartile	1101	3.733***	3.205***	5.360
Deal Characteristics				
CAR (-2,0)	4405	0.003	0.002	0.070
CAR (-3,0)	4405	0.004	-0.001	0.086
CAR (-2,+1)	4405	0.006	0.004	0.083
M&A Premium	4005	12.868	-1.693	587.289
Number of days to completion	4405	169.971	92.000	282.696
Bidder Characteristics				
Debt Ratio	4250	1.234	0.989	9.281
Interest Coverage Ratio	3813	45.935	5.336	470.833
Bidder Size	4405	$7,672,290,000	$906,695,000	$28,051,850,000
Tobin's Q	4370	2.160	1.604	2.509

KZ Index is calculated from Equation 1 and represents the financial constraint index of a target firm. The higher the value of the KZ Index, the more financially constrained is the target firm. CAR (-2,0) represents the bidder's three-day cumulative abnormal returns with day 0 being the M&A announcement day; CAR (-3, 0) represents the bidder's four-day cumulative abnormal returns with day 0 being the M&A announcement day; CAR (-2,+1) represents the bidder's four-day cumulative abnormal returns with day 0 being the M&A announcement day. M&A Premium represents the difference between the deal value and the target's market capitalization four weeks prior to the announcement (expressed as a % of the latter). Debt Ratio is the bidder's total liabilities divided by market value of equity, as of four weeks prior to the announcement. Interest coverage ratio of the bidder is calculated as EBIT divided by interest expenses in year t-1. BIDDER SIZE is the natural logarithm of the book value of total assets of the bidder in the year t-1. TARGET SIZE is the natural logarithm of the book value of total assets of the target in the year t-1. TOBIN'S Q equals to market value of assets (market value of equity- book value of equity + total assets) scaled by total assets in the year t-1. Number of days to completion represents the number of days from announcement to completion. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table 3: Cumulative Abnormal Returns (CARs) by Quartlies of KZ Index

	N	*Mean*	*Median*	*Standard Deviation*
CAR (-2,0) by Quartiles:				
1st Quartile	1102	-0.076***	-0.059***	0.051
2nd Quartile	992	-0.012***	-0.010***	0.009
3rd Quartile	1209	0.012***	0.010***	0.009
4th Quartile	1102	0.086***	0.070***	0.056
CAR (-3,0) by Quartiles:				
1st Quartile	1101	-0.088***	-0.065***	0.067
2nd Quartile	1121	-0.014***	-0.014***	0.009
3rd Quartile	1082	0.017***	0.016***	0.011
4th Quartile	1101	0.103***	0.076***	0.076
CAR (-2,+1) by Quartiles:				
1st Quartile	1101	-0.090***	-0.070***	0.058
2nd Quartile	994	-0.013***	-0.013***	0.010
3rd Quartile	1209	0.018***	0.016***	0.018
4th Quartile	1101	0.107***	0.083***	0.064

CAR (-2,0) represents the bidder's three-day cumulative abnormal returns with day 0 being the M&A announcement day; CAR (-3, 0) represents the bidder's four-day cumulative abnormal returns with day 0 being the M&A announcement day; CAR (-2,+1) represents the bidder's four-day cumulative abnormal returns with day 0 being the M&A announcement day.

Table 4: Comparison of Cumulative Abnormal Returns (CARs) and M&A Premiums between acquisitions of FCTs and non-FCTs

	N	Mean	Median
Panel A: Comparison of Bidders' (-3, 0) Announcement Period CARs			
4th vs. 1st Quartiles			
Bidder of FCTs (4th Quartile)	1,101	0.007***	-0.001
Bidder of non-FCTs (1st Quartile)	1,085	-0.003	-0.001
Difference		0.010	0.000
t-stat/Wilcoxon		2.580***	1.889*
3rd and 4th as a group vs. 1st Quartiles			
Bidder of FCTs (3rd and 4th Quartiles)	2,205	0.008***	0.000
Bidder of non-FCTs (1st Quartile)	1,085	-0.003	-0.001
Difference		0.011	0.001
t-stat/Wilcoxon		3.290***	2.416**
Panel B: Comparison of M&A Premiums paid by Bidders of FCTs and non-FCTs			
4th vs. 1st Quartiles			
Bidder of FCTs (4th Quartile)	977	4.3698*	-1.503***
Bidder of non-FCTs (1st Quartile)	1,016	38.937	-1.711***
Difference		-34.567	-0.792
t-stat/Wilcoxon		-0.930	-2.181**
3rd and 4th as a group vs. 1st Quartiles			
Bidder of FCTs (3rd and 4th Quartiles)	1,977	3.502**	-1.662***
Bidder of non-FCTs (1st Quartile)	1,016	38.937	-1.711***
Difference		-35.434	0.049
t-stat/Wilcoxon		-1.350	1.511

CAR (-3, 0) represents the bidder's four-day cumulative abnormal returns with day 0 being the M&A announcement day. In both panels, targets in quartile 1 are unconstrained (i.e., non-FCTs). Financially constrained targets (FCTs) come from quartiles 3 and 4. M&A Premium represents the difference between the deal value and the target's market capitalization four weeks prior to the announcement (expressed as a % of the latter). *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table 5: Heckman Two-Stage Regressions of Bidders' CARs

	Panel A		**Panel B**	
	Sample includes [Q1] vs. [Q4]		*Sample includes [Q1] vs. [Q3 and Q4]*	
	Probit	*CARs*	*Probit*	*CARs*
FCT		0.046**		0.039**
DEBTRATIO	-0.006	0.000	-0.005	0.000*
ICR	-0.000***	0.000	0.000	0.000
BIDDER SIZE	0.068***	-0.003**	0.069***	-0.004***
RELATED	0.146*	-0.011**	0.064	-0.009**
CRISIS	0.042	-0.012	0.157	-0.014
SOX	0.250	0.016	-0.171	0.022**
ALLCASH	-0.329***	0.015***	-0.184***	0.013***
FRIENDLY	0.140	-0.004	0.027	-0.005
AACOUNT	-0.036	0.002	-0.029	0.003
TARGET SIZE	-0.114***	0.000	-0.067***	-0.001
ACA	0.233**	0.010	0.188**	0.009*
TENDER OFFER	-0.112	0.011	-0.093	0.004
BIDDER ROE		0.000		-0.001
TECH BUBBLE		-0.014		-0.023*
MULTIPLE BIDS	0.455***		0.363***	
M&A ACTIVITY	-0.308		0.326	
TACOUNT	0.090		0.076	
COMPLETION	0.000		0.000	
TECH TARGET	0.385***		0.358***	
TECH BIDDER	0.450***		0.444***	
IMR		-0.021*		-0.017*
Constant	2.432	-0.009	-4.629	0.001
Observations	*1810*	*1810*	*2824*	*2824*
Year Dummies	*Yes*	*Yes*	*Yes*	*Yes*
Chi- squared	*250.320*	*172.130*	*225.060*	*174.090*
Pseudo R-squared	*0.100*		*0.066*	

CAR (-3, 0) represents the bidder's four-day cumulative abnormal returns with day 0 being the M&A announcement day. In both probit regressions, targets in quartile 1 takes a value of 0 since they are the least financially constrained. FCT is a dummy variable representing financially constrained targets (i.e., targets in Quartile 4 and in Quartiles 3 and 4 as a group in Panels A and B, respectively. PREMIUM represents the difference between the deal value and the target's market capitalization four weeks prior to the announcement (expressed as a % of the latter). DEBTRATIO is the bidder's total liabilities divided by market value of equity, as of four weeks prior to the announcement. ICR is the

interest coverage ratio of the bidder calculated as EBIT divided by interest expenses in year t-1. BIDDER SIZE is the natural logarithm of the book value of total assets of the bidder in the year t-1. RELATED is a dummy variable representing M&A where the bidder shares the same two-digit SIC as the target. CRISIS is a dummy variable representing the years 2008-2012 related to the global financial crisis that severely restricted the M&A market. SOX is a dummy variable representing the years starting 2002 following the passage of the Sarbanes-Oxley Act. ALLCASH is a dummy variable representing deals financed by all cash. Friendly is a dummy variable representing friendly as opposed to hostile bids. AACOUNT represents the number of bidder's advisors. TARGET SIZE is the natural logarithm of the book value of total assets of the target in the year t-1. ACA is a dummy variable representing acquisitions of certain assets only. TENDER OFFER is a dummy variable representing tender offers. Bidder's ROE is measured at t-1. TECHBUBLE is a dummy variable that takes a value of 1 for the years 2001, 2002, 2003, and 2004 and 0 otherwise. MULTIPLEBIDS represents the number of bidders. M&A ACTIVITY is the natural logarithm of the total number of M&A in year t. TACOUNT represents the number of target advisors. COMPLETION represents the number of days from announcement to completion. TECH TARGET and TECH BIDDER are dummy variables representing tech- targets and bidders, respectively. IMR is the inverse Mills ratio derived from the probit model. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.

Table 6: Heckman Two-Stage Regressions of M&A Premiums

	Panel A		**Panel B**	
	Sample includes [Q1] vs. [Q4]		*Sample includes [Q1] vs. [Q3 and Q4]*	
	Probit	*M&A Premium*	*Probit*	*M&A Premium*
FCT		-405.100**		-367.300***
DEBTRATIO	-0.006	-0.738	-0.006	-0.626
ICR	-0.001***	-0.062	-0.000	-0.005
BIDDER SIZE	0.059***	18.140	0.067***	12.030
RELATED	0.112	36.350	0.054	14.220
CRISIS	-0.022	-29.450	0.111	5.453
SOX	0.318	-34.960	-0.159	-50.420
ALLCASH	-0.326***	-35.770	-0.188***	-17.310
FRIENDLY	0.12	-5.586	-0.015	-16.700
AACOUNT	-0.042	-24.340	-0.040	-15.120
TARGET SIZE	-0.110***	4.381	-0.068***	6.730
ACA	0.259**	9.984	0.208**	1.391
TENDEROFFER	-0.021	0.605	-0.008	2.549
ROEBIDDER		1.740		0.821
TECHBUBBLE		51.440		43.51
MULTIPLEBID	0.406***		0.327**	
MAACTIVITY	-0.483		0.276	
TACOUNT	0.130*		0.120*	
COMPLETION	-0.000		-0.000	
TECHTARGET	0.416***		0.380***	
TECHBIDDER	0.446***		0.433***	
IMR		232.300*		199.200**
Constant	4.591	72.660	-3.964	156.900
Observations	*1,654*	*1,654*	*2,568*	*2,568*
Year Dummies	*Yes*	*Yes*	*Yes*	*Yes*
Prob > Chi-squared	*0.000*	*0.000*	*0.000*	*0.000*
Chi- squared	*234.120*	*123.780*	*207.920*	*90.550*
Pseudo R-squared	*0.102*		*0.066*	

M&A PREMIUM represents the difference between the deal value and the target's market capitalization four weeks prior to the announcement (expressed as a % of the latter). In both probit regressions, targets in quartile 1 takes a value of 0 since they are the least financially constrained. FCT is a dummy variable representing financially constrained targets (i.e., targets in Quartile 4 and in Quartiles 3 and 4 as a group in Panels A and B, respectively. DEBTRATIO is the bidder's total liabilities divided by market value of equity, as of four weeks prior to the announcement. ICR is the

interest coverage ratio of the bidder calculated as EBIT divided by interest expenses in year t-1. BIDDER SIZE is the natural logarithm of the book value of total assets of the bidder in the year t-1. RELATED is a dummy variable representing M&A where the bidder shares the same two-digit SIC as the target. CRISIS is a dummy variable representing the years 2008-2012 related to the global financial crisis that severely restricted the M&A market. SOX is a dummy variable representing the years starting 2002 following the passage of the Sarbanes-Oxley Act. ALLCASH is a dummy variable representing deals financed by all cash. Friendly is a dummy variable representing friendly as opposed to hostile bids. AACOUNT represents the number of bidder's advisors. TARGET SIZE is the natural logarithm of the book value of total assets of the target in the year t-1. ACA is a dummy variable representing acquisitions of certain assets only. TENDER OFFER is a dummy variable representing tender offers. Bidder's ROE is measured at t-1. TECHBUBLE is a dummy variable that takes a value of 1 for the years 2001, 2002, 2003, and 2004 and 0 otherwise. MULTIPLEBIDS represents the number of bidders. M&A ACTIVITY is the natural logarithm of the total number of M&A in year t. TACOUNT represents the number of target advisors. COMPLETION represents the number of days from announcement to completion. TECH TARGET and TECH BIDDER are dummy variables representing tech- targets and bidders, respectively. IMR is the inverse Mills ratio derived from the probit model. *, **, *** represent statistical significance at the 10%, 5% and 1% level, respectively.